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U.S. DEPARTMENT OF COMMERCE
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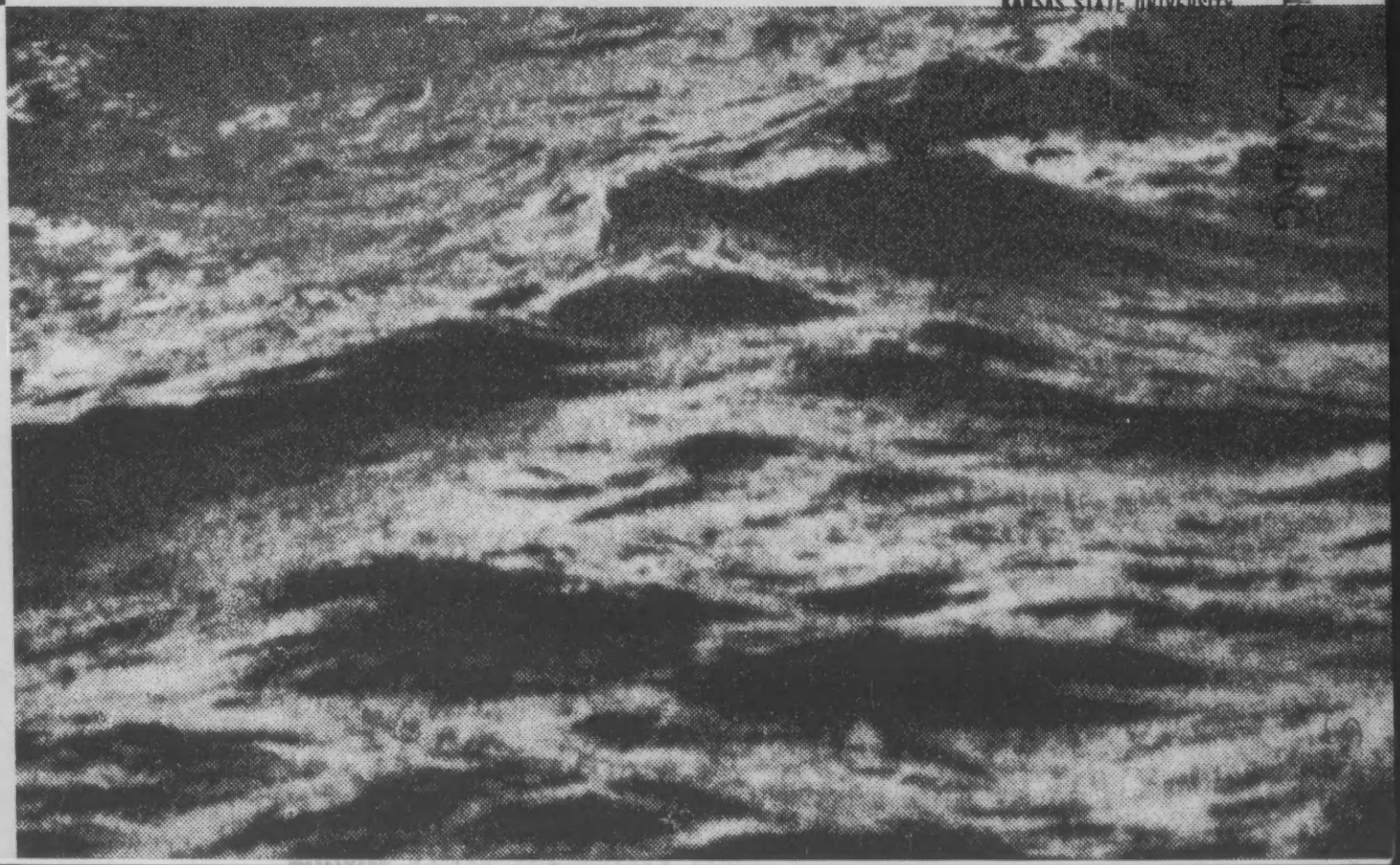

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UNITED STATES DEPARTMENT OF COMMERCE
Peter G. Peterson, *Secretary*

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FOREWORD

The Department of Commerce's National Marine Fisheries Service publishes the monthly journal *Commercial Fisheries Abstracts* as one means of communicating to the fishing industry and allied groups the status of current fishery research. The research includes the biological aspects of fishery science as well as technological studies dealing with aquatic resource supply, harvesting, processing, utilization, and distribution.

Commercial Fisheries Abstracts contains summaries of selected articles from trade, engineering, and scientific journals dealing with the entire spectrum of fishery science. The publication is designed to serve the needs of fishery scientists, engineers, and managers in industry, academic institutions, and government by supplying timely information on current progress in fishery research and technology.

For sale by the Superintendent of Documents, U.S. Government Printing Office Washington, D.C. 20402 - Subscription price: $3.50 per year ($1.00 additional for foreign mailing). Cost per single issue - $0.35.

0.118 (9.19) INSTRUMENTS FOR WATER QUALITY MONITORING

Ballinger, Dwight G. (Environmental Protection Agency, Cincinnati, OH 45202)
Environmental Science & Technology 6, No. 2, 130-133 (February 1972)

Monitoring the environment is necessary to help define the nature and extent of pollution problems in order to develop an intelligent plan for pollution abatement. This article is a brief summary of the instruments available to industries and agencies that must monitor many water quality parameters.
[6 tables, 1 figure, 5 references] FTP

0.33 EFFECTS OF ZIRCONIUM AND ALUMINUM COMPOUNDS AND PH ON THE MAILLARD REACTION

Powell, R. C. T., and A. A. Spark (Ministry of Agriculture, Fisheries and Food, Food Research Institute, Colney Lane, Norwich, NOR70F, England)
Journal of the Science of Food and Agriculture 22, No. 11, 597-599 (Nov. 1971)

This paper reports on the examination of the action of aluminum and zirconium salts in limiting the extent of color development (Maillard reaction) in a glucose-glycine model system. Certain salts of aluminum and zirconium are capable of retarding the Maillard reaction in the model system; such effect is almost entirely due to the influence of pH. Apparently, the pH influences the ionization equilibrium of the amino acids which in turn influences the reaction rate.
[5 figures, 43 references] FTP

0.33 INHIBITION OF FLESH BROWNING AND SKIN COLOR FADING IN FROZEN FILLETS OF YELLOWEYE SNAPPER (LUTJANUS VIVANUS)

Thompson, Harold C., Jr., and Mary H. Thompson (Fishery Products Technology Laboratory, National Marine Fisheries Service, NOAA, Pascagoula, MI 39567)
NOAA Technical Report NMFS SSRF-644, 6 pp. (Feb. 1972) (National Marine Fisheries Service, NOAA, U.S. Department of Commerce, Seattle, WA 98115) For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Price $0.25.

This paper reports the results of an experiment in which fresh yelloweye snapper (scaled and eviscerated) were treated with 3,3′-thiodipropionic acid, glutathione, or disodium ethylenediaminetetraacetate dihydrate in combination with propyl gallate or monotertiary butylhydroquinone. The treated samples were stored at -10° F. for 12 months. The purpose of this experiment was to determine whether the chemicals had any effect on the development of the browning of the flesh (Maillard reaction) of the fish. A secondary purpose was to determine the effect of vacuum packaging of the fish on the development of discoloration of the skin of the fish. [3 tables, 27 references] FTP

0.35 (0.5) MECHANISM OF MERCURIC CHLORIDE RESISTANCE IN MICROORGANISMS. I. VAPORIZATION OF A MERCURY COMPOUND FROM MERCURIC CHLORIDE BY MULTIPLE DRUG RESISTANT STRAINS OF ESCHERICHIA COLI

Kōmura, Ichirō, and Kazuo Izaki (Department of Agricultural Chemistry, Faculty of Agriculture, Tohoku University, Sendai, Japan)
Journal of Biochemistry 70, No. 6, 885-893 (Dec. 1971) (Japanese Biochemical Society, Japan Academic Societies Center Bldg., 2-4-16, Yoyoi, Bunkyo-ku, Tokyo 113, Japan)

Because highly toxic mercurials are used as pesticides, information on the fate of these chemicals in the biosphere is essential. In the present study, the authors examined the metabolism of mercurials in drug-resistant strains of the bacterium E. coli. They found that the resistance to $HgCl_2$ can be transferred from a resistant strain of E. coli to sensitive strains of E. coli and Aerobacter aerogenes. The resistant strains of E. coli could grow in the presence of 0.02 mM $HgCl_2$, but the sensitive strain failed to grow in the presence of 0.01 mM $HgCl_2$. When the resistant strain of E. coli was cultivated in the presence of $^{203}HgCl_2$, glucose, and NaCl in phosphate buffer, the cells vaporized a form of radioactive mercury; however, the sensitive strain, under the same conditions, did not show such activity. [7 figures, 4 tables, 21 references] FTP

0.38 (0.5)(9.19) METALLIC MERCURY-RELEASING ENZYME IN MERCURY-RESISTANT PSEUDOMONAS

Furukawa, Kensuke, and Kenzo Tonomura (Fermentation Research Institute, Inage, Chiba, Japan)
Agricultural and Biological Chemistry 36, No. 2, 217-226 (Feb. 1972)

A metallic mercury-releasing enzyme, which catalyzes the reduction of organic and inorganic mercurials to metallic mercury was extracted from the cells of mercury-resistant Pseudomonas and concentrated 90-fold. The enzyme was purified from the cell-free extract of the Pseudomonas by precipitation with ammonium sulfate and repeated column chromatography on Sephadex G-150 and on DEAE-Sephadex. The purified enzyme gave a single band in electrophoresis on polyacrylamide gel, and a characteristic absorption spectrum indicative of flavoprotein. The prosthetic group of the enzyme was identified as FAD (flavin-adenine dinucleotide). Organic and inorganic mercurials were decomposed to metallic mercury by action of the enzyme in the presence of reduced NADP (oxidoreductase) generating system and cytochrome c-I.
[14 figures, 2 tables, 8 references] FTP

0.38 LIVER ARGINASE ACTIVITY IN THE SOCKEYE SALMON, ONCORHYNCHUS NERKA

Cvancara, Victor A. (Dep. Biol., Wisconsin State Univ., Eau Claire, Wis.)
Chemical Abstracts 76, No. 3, 11430k (Jan. 17, 1972)

0.4 (9.6) BIOCHEMICAL ASPECTS OF CHEMICAL CARCINOGENS WITH REFERENCE TO AFLATOXINS AND NITROSAMINES

Den Engelse, L.
Voeding 33, No. 1, 17-39 (1971) (In Dutch)
BFMIRA Abstracts 25, No. 3, Abstract No. 826, 168 (Mar. 1972)

A review of the literature on nitrosamines and aflatoxins is given with 94 references. C.S.B.

Reprinted FTP

0.34 SPECTRAL AND GAS CHROMATOGRAPHIC CHARACTERISTICS OF SOME N-NITROSAMINES

Pensabene, John W., Walter Fiddler, Calvin J. Dooley, Robert C. Doerr, and Aaron E. Wasserman (Eastern Regional Research Laboratory, U.S. Department of Agriculture, Philadelphia, PA 19118)
Journal of Agricultural and Food Chemistry 20, No. 2, 274-277 (Mar.-Apr. 1972)

Because of the current interest in the study of N-nitrosamines in foods, the authors prepared, for reference purposes, a compilation of some of the physical properties of these compounds such as boiling points or melting points, and gas-liquid chromatographic, infrared and mass spectral data (most of which are not available in the literature). They mention that the most extensive review on the properties of N-nitroso compounds was prepared by H. Druckrey, R. Preussmann, S. Ivankovic, and D. Schmael [Z. Krebsforsch. 69, 103 (1967)]. Such information is useful to the analyst because the accuracy of earlier reports on nitrosamines in foods is questionable inasmuch as specific methods for confirming the identity of the nitrosamines were not utilized and a number of other food components are known to appear as artifacts in the analyses.
[2 figures, 1 table, 22 references] FTP

0.35 IDENTIFICATION AND QUANTIFICATION OF CORTICOSTEROIDS IN THE ATLANTIC HALIBUT, HIPPOGLOSSUS HIPPOGLOSSUS L.

Weisbart, Melvin, and D. R. Idler (Fisheries Research Board of Canada, Halifax Laboratory, Halifax, Nova Scotia, Canada)
General and Comparative Endocrinology 17, No. 3, 416-423 (Dec. 1971)

On the basis of tentative and definitive identifications, earlier work has shown that cortisol is present in the plasma of several teleost fishes; however, only in the salmonids has there been rigorous proof of the presence of cortisol in the plasma. In the present study, cortisol and cortisone were definitly identified in the plasma of the Atlantic halibut. The authors indicate that this study extends the rigorous proof of cortisol beyond the salmonids and supports the view that cortisol is one of the major corticosteroids in teleosts.
[2 figures, 5 tables, 25 references] FTP

0.4 (9.12) ACTIVE TRANSPORT OF POTASSIUM AND CHLORIDE IN AN IDENTIFIABLE MOLLUSCAN NEURON

Russell, J. M., (Department of Physiology, University of Utah Medical Center, Salt Lake City, UT 84112), and A. M. Brown (Department of Physiology and Medicine, University of Utah Medical Center)
Science 175, No. 4029, 1475-1477 (Mar. 31, 1972)

The results presented in this report suggest that (1) K^+ is actively transported into the giant neuron R2 of the Aplysia abdominal ganglion, (2) Cl^- is actively transported out of this neuron, and the transport systems for K^+ and Cl^- are different. [1 figure, 1 table, 20 references] FTD

0.4 (9.12) ACETYLCHOLINE: POSSIBLE NEUROMUSCULAR TRANSMITTER IN CRUSTACEA

Futamachi, Kin J. (Department of Neurology, Stanford University School of Medicine, Stanford, CA 94305)
Science 175, No. 4028, 1373-1375 (Mar. 24, 1972)

This paper presents evidence that acetylcholine may be the neuromuscular transmitter to the tonic flexor muscles in crayfish.
[2 figures, 18 references] FTP

0.4 (9.12) MECHANISM OF MERCURIC CHLORIDE RESISTANCE IN MICROORGANISMS. II. NADPH-DEPENDENT REDUCTION OF MERCURIC CHLORIDE AND VAPORIZATION OF MERCURY FROM MERCURIC CHLORIDE BY A MULTIPLE DRUG RESISTANT STRAIN OF ESCHERICHIA COLI

Kōmura, Ichirō, Tsukasa Funaba, and Kazuo Izaki (Department of Agricultural Chemistry, Faculty of Agriculture, Tohoku University, Sendai, Japan)
Journal of Biochemistry 70, No. 6, 895-901 (Dec. 1971) (Japanese Biochemical Society, Japan Academic Societies Center Bldg., 2-4-16, Yoyoi, Bunkyo-ku, Tokyo 113, Japan)

Part I of this series was published on pages 885-893 of the same issue of this journal. The authors concluded that NADPH, and to a lesser extent, NADH, act as electron donors for the enzymatic reduction of $HgCl_2$ and the vaporization that occurs after this reduction by a multiple drug resistant strain of E. coli. The reduction of $HgCl_2$ and the subsequent vaporization of a form of Hg seems to account for the mechanism of resistance to $HgCl_2$ in E. coli strains having multiple drug resistance.
[4 figures, 4 tables, 15 references] FTP

0.35 (0.5)

0.32 THE CRYSTAL STRUCTURE OF BONITO (KATSUO) FERROCYTOCHROME C AT 4 Å RESOLUTION

Ashida, Tamaichi, Tatzuo Ueki, Tomitake Tsukihara, Akio Sugihara, Tsunehiro Takano, and Masao Kakudo (Institute for Protein Research, Osaka University, Osaka, Japan)
Journal of Biochemistry 70, No. 6, 913-924 (Dec. 1971) (Japanese Biochemical Society, Japan Academic Societies Center Bldg., 2-4-16, Yoyoi, Bunkyo-ku, Tokyo 113, Japan)

Cytochrome c is a one-electron carrier in the oxidation-reduction system in mitochondria. Previous work has indicated differences in the physical and chemical properties in the oxidized and reduced states of this protein. This paper provides information on the crystal structure analysis of bonito ferrocytochrome c at 4 Å resolution.
[10 figures, 2 tables, 19 references] FTP

0.35 ANTIRADIOMIMETIC EFFECT OF SOME COMPOUNDS EXTRACTED FROM MARINE INVERTEBRATES

Brekhman, I. I., V. A. Gonenko, and E. Ya. Kostetskii (Inst. Biol. Act. Subst., Vladivostok, U.S.S.R.)
Chemical Abstracts 76, No. 3, 10223h (Jan. 17, 1972)

0.38 ENZYME KINETICS AND ENGINEERING

Carbonell, R. G., and M. D. Kostin (Department of Chemical Engineering, Princeton University, Princeton, NJ 08540)
AIChE Journal 18, No. 1, 1-12 (Jan. 1972)

This article is a review of representative literature on enzyme kinetics and engineering that was published from January 1969 to August 1971. The first section of the report deals with the production and purification of enzymes. It covers recent attempts to extract enzymes from microbial and vegetable sources and the possibility of artificially synthesizing enzymes. The second section deals in detail with enzyme kinetics. The authors first discuss Michaelis-Menten kinetics, then they consider the effects of pH, temperature, metal ions, inhibitors, and activators on the enzyme reaction rate. The third section reviews articles on the development of water-insoluble enzyme derivatives. Four methods of attaching enzymes to solid supports are considered: (1) covalent bonding to an insoluble carrier, (2) polymer entrapment, (3) covalent cross-linking, and (4) physical absorption. The last section discusses some of the applications of enzymes to medicine, analytical chemistry, and the chemical industry.
[200 references] FTP

0.4 (9.12) 1-METHYLADENINE BIOSYNTHESIS IN STARFISH OVARY: ACTION OF GONAD-STIMULATING HORMONE IN METHYLATION

Shirai, H., H. Kanatani (Ocean Research Institute, University of Tokyo, Tokyo 164, Japan), and S. Taguchi (Division of Biology, National Institute of Radiological Sciences, Chiba, Chiba-ken 280, Japan)
Science 175, No. 4028, 1366-1368 (Mar. 24, 1972)

Because methionine (in its active form, S-adenosylmethionine) donates the methyl group in many biological methylations, the authors carried out a study to determine whether methionine is also a methyl donor in the synthesis of 1-methyladenine in the starfish ovary. A hormonal peptide, gonad-stimulating substance (released from the nervous system of starfishes) acts on the ovary to produce 1-methyladenine. The present results show that methionine enhances the production of 1-methyladenine in the presence of the gonad-stimulating substance (GSS); in the absence of GSS, production of 1-methyladenine is not detectable. Apparently, methionine is a methyl donor in the biosynthesis of 1-methyladenine, suggesting that gonad-stimulating substance is involved in the methylation process.
[2 figures, 16 references] FTP

0.5 EFFECTS OF INCUBATION TEMPERATURE ON THE SALT TOLERANCE OF SALMONELLA

Matches, Jack R., and J. Liston (Institute of Food Science and Technology, College of Fisheries, University of Washington, Seattle, WA 98195)
Journal of Milk and Food Technology 35, No. 1, 39-44 (Jan. 1972)

Small numbers of salmonellae may increase to infective levels in foods if these foods have not been properly processed and stored. Earlier work has shown that salt is effective in preventing growth of salmonellae in foods. Because many foods contain low levels of salt (sublethal for Salmonellae), the present researchers examined the potential for growth of Salmonellae in the presence of salt at various temperatures. They determined the growth of S. heidelberg, S. typhimurium, and S. derby in nutrient broth containing 0% to 8% added NaCl (in 0.5% or 1% increments). Incubation temperatures used were 8°, 12°, 22°, and 37° C. S. heidelberg was also tested in the culture medium containing 0% to 9% added NaCl and at temperatures of 39°, 41°, 43°, and 45° C.

Low levels of salt stimulated growth of salmonellae; this stimulation was more pronounced at low temperatures than at temperatures near the optimum for the organisms.

Because salt is used to preserve foods, these data have serious implications in the preservation of perishable foods. Concentrations of salt sufficient to prevent the growth of salmonellae in foods stored at low temperatures may not be sufficient to prevent growth of salmonellae at higher temperatures.
[5 figures, 18 references] FTP

0.5 STAPHYLOCOCCUS AUREUS AND STAPHYLOCOCCAL FOOD INTOXICATIONS. A REVIEW. II. ENTEROTOXINS AND EPIDEMIOLOGY

Minor, T. E., and E. H. Marth (Department of Food Science and the Food Research Institute, University of Wisconsin, Madison, WI 53706)
Journal of Milk and Food Technology 35, No. 1, 21-29 (Jan. 1972)

Staphylococcal food poisoning is an intoxication caused by a water-soluble protein (enterotoxin) secreted by the bacterial cells. Part I of this review was published in an earlier issue of this journal and covered the nature of staphylococci stressing their taxonomy, cultural and physiological characteristics, isolation, and activity in bacterialogical media. In this part (II), the authors review certain aspects of staphylococcal intoxications including (1) description and general properties of the enterotoxins, (2) production of enterotoxins, (3) assays for enterotoxins, and (4) epidemiology of staphylococcal intoxications. Parts III and IV of this series will appear in subsequent issues of this journal and the last part will contain the references cited. FTP

0.4 (0.7) PARTIAL CHARACTERIZATION OF LIVER PROTEINS FOLLOWING EXPOSURE TO MERCURY

Bryan, Sara E., and Eugene F. Hayes (Department of Biological Sciences, Louisiana State University, Lake Front, New Orleans, LA 70122)
FEBS Letters 21, No. 1, 21-24 (Mar. 1972)

Protein induction, a selective means for regulating in vivo levels of proteins, is one cellular occurrence in which detoxifying proteins are increased, thus enabling an animal to adapt to higher levels of a toxic substance. Earlier work has shown that certain metals function as activating or depressing agents in the regulation of protein synthesis and protein turnover. Data presented in the present report, collected in experiments with mice, suggest that levels of mercury are tolerated under conditions which appear to involve induction-detoxification processes. The authors found that soluble proteins from mercury-treated mice increased and proteins known to contain specific binding sites for mercury are cited as possible candidates for the stimulated molecules.
[2 figures, 1 table, 7 references] FTP

0.5 BACTERIOPHAGE AND THE TOXIGENICITY OF CLOSTRIDIUM BOTULINUM TYPE D

Eklund, M., W., F. Poysky, and S. M. Reed (National Marine Fisheries Service, NOAA, U.S. Department of Commerce, 2725 Montlake Blvd. East, Seattle, WA 98102 U.S.A.)
Nature New Biology 235, No. 53, 16-17 (Jan. 5, 1972)

The authors provide in this report conclusive evidence for the involvement of bacteriophage designated DE8 in the toxigenicity of C. botulinum type D, South African strain. [1 figure, 2 tables, 9 references] FTP

0.4 (9.19) BIOTRANSFORMATION OF METHYL MERCURIC SALTS IN GERM FREE RATS

Norseth, Tor (Institute of Occupational Health, Gydas vei 8, Oslo 3, Norway)
Acta Pharmacologica et Toxicologica 30, Nos. 3-4, 172-176 (1971) (Munksgaard, 6, Nørregade, DK-1165 Copenhagen K, Denmark)

T. Norseth and T. W. Clarkson [Biochem. Pharmacol. 19, 2775-2783 (1970)] and T. Norseth [Acta pharmacol. et toxicol. 29, 375-384 (1971)] showed that cleavage of the carbon-mercury bond in methyl mercuric salts in vivo releasing inorganic mercury occurs in rats and in mice. Some earlier results also indicated that the release of inorganic mercury in the rat was caused by microorganisms in the gastrointestinal track. In the present study, therefore, the author examined the release of inorganic mercury from methyl mercuric salts in vivo using germ-free rats. He compared the amounts of inorganic mercury in the intestinal content from the cecum and in feces of the test rats with corresponding samples obtained from control rats. He found no differences in the biotransformation in germ-free rats and control rats. [2 figures, 6 references] FTP

0.5 INHIBITION OF CLOSTRIDIUM BOTULINUM BY SODIUM NITRITE AS AFFECTED BY BACTERIOLOGICAL MEDIA AND MEAT SUSPENSIONS

Johnston, M. A., and R. Loynes
Can. Inst. Fd Technol. J. 4, No. 4, 179-184 (1971)
EPMIRA Abstracts 25, No. 3, Abstract No. 729, 149 (Mar. 1972)

The present studies have shown that the inhibition of growth of C1. botulinum by sodium nitrite does vary according to the growth medium used. Care must therefore be exercised in selecting media to study the mechanism of action of sodium nitrite in commercially prepared cured meats. S.M.S. Reprinted

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0.5 CORRELATION OF FATTY ACID COMPOSITION WITH THERMAL RESISTANCE OF E. COLI

Hansen, E. Wind (Royal Danish School of Pharmacy, Department of Microbiology, Universitetsparken 2, DK-2100 København Ø, Denmark)
Dansk Tidsskrift for Farmaci 45, No. 10, 339-344 (1971) (Pharmaceutical Society of Denmark, Universitetsparken 2, DK-2100 København Ø, Denmark)

Cultures of E. coli were grown in minimal medium at different temperatures. The proportions of RNA, DNA, and protein were independent of the growth temperature, but the thermal resistance and fatty acid composition varied significantly. The author found a clear correlation between fatty acid composition and thermal resistance. [1 figure, 2 tables, 16 references] FTP

0.5 MICROBIAL TOXINS. A COMPREHENSIVE TREATISE

Authors and titles as listed below
Academic Press, 111 Fifth Ave., New York, NY 10003 (Dates, pages, prices listed below).

Vol. 1,"Bacterial Protein Toxins," edited by S. J. Ajl, S. Kadis, and T. C. Montie, with introduction by Dr. Alwin M. Pappenheimer, Jr. (1970), 517 pp., $23.00 (subscription price $19.55); Vol. 2A, "Bacterial Protein Toxins," edited by S. Kadis, T. C. Montie, and S. J. Ajl (Apr. 1971), 434 pp., $22.00 (subscription price $18.70); Vol. 3, Bacterial Protein Toxins," edited by T. C. Montie, S. Kadis, and S. J. Ajl (1970), 572 pp., $27.00 (subscription price $22.95); Vol. 4, "Bacterial Endotoxins," edited by G. Weinbaum, S. Kadis, and S. J. Ajl (1971), 473 pp., $26.00 (subscription price $22.10); Vol. 5, "Bacterial Endotoxins," edited by S. Kadis, G. Weinbaum, and S. J. Ajl (Sept. 1971), 532 pp., $27.00 (subscription price $22.95); Vol. 6, "Fungal Toxins," edited by A. Ciegler, S. Kadis, and S. J. Ajl (Oct. 1971), 586 pp., $29.00 (subscription price $24.65); Vol. 7, "Algal and Fungal Toxins," edited by S. Kadis, A. Ciegler, and S. J. Ajl (Dec. 1971), 418 pp., $22.00 (subscription price $18.70).

The following volumes are in preparation:

Vol. 2B, "Bacterial Protein Toxins," edited by S. Kadis, T. C. Montie, and S. J. Ajl (1972), about 150 pp.; Vol. 8, "Fungal Toxins," edited by S. Kadis, A. Ciegler, and S. J. Ajl (Mar. 1972), about 375 pp.

According to the publisher, the subscription prices for the individual volumes are valid only when orders for the complete set are received before publication of the last volume. FTP

0.5 EFFECT OF pH ON LOW TEMPERATURE GROWTH OF SALMONELLA

Matches, J. R., and J. Liston (Institute for Food Science and Technology, College of Fisheries, University of Washington, Seattle, WA 98195)
Journal of Milk and Food Technology 35, No. 1, 49-52 (Jan. 1972)

This paper contains data on the ability of Salmonella heidelberg, S. typhimurium, and S. derby to grow at low temperatures over the pH range of from 4.0 to 9.0. The three Salmonella serotypes grew only over a narrow pH range between 6 and 8 at temperatures close to 5° C. The authors indicate that these results reinforce earlier published conclusions that foods held at temperatures below 5° C. will not support growth of Salmonella.
[1 figure, 1 table, 10 references] FTP

0.6 FLAVOURS IN NOVEL FOODS

Heath, H. B. (Bush Boake Allen Ltd.)
Food Manufacture 47, No. 1, 21-22, 25 (Jan. 1972)

The author estimates that by 1980 20 percent of the total manufacturing beef and 25% of the total manufacturing pork in the U.K. will have been replaced by synthetic meat. The extent to which synthetic analogues can be accepted as total replacement for long-established food products will depend upon the success technologists will have in solving the three criteria by which we judge what we are eating, namely, appearance, texture, and flavor. The physical appearance of the analogue is easily solved; the texture presents some difficulties; but the substitution of a flavor which exactly matches the natural product in the form that it is eaten presents the most difficult problem to be solved. A secondary problem relates to the restrictive legislation governing the use of chemicals in foodstuffs.

Up to now the approach to flavoring synthetic analogues has been through the use of permitted flavoring chemicals--natural and synthetic. The real success in flavoring synthetic analogues, however, will be found in the selection and adoption of flavor precursor systems which may be flavorless but will impart an aromatic effect after the correct degree of processing as it occurs in natural raw meats. FTP

0.6 "FERRIPOLYPHOSPHATE" AS A WHEY PROTEIN PRECIPITANT
(6.54)

Jones, Susan B., Edwin B. Kalan, Thomas C. Jones, and J. Frederick Hazel (Eastern Marketing and Nutrition Research Division, U.S. Department of Agriculture, Philadelphia, PA 19118)
Journal of Agricultural and Food Chemistry 20, No. 2, 229-232 (Mar.-Apr. 1972)

In this paper, the authors describe the preparation of an iron polyphosphate-protein powder from cheese whey by means of a precipitation technique using "ferripolyphosphate," a complex of ferric ions with a long-chain polyphosphate. The soluble ferripolyphosphate complex was prepared as follows: Ferric chloride solution (0.5 M) was made at room temperature from reagent grade solid iron(III) chloride hexahydrate and distilled water. A solution, containing 3 M sodium phosphate monomer, was prepared at room temperature by dissolving 30.6 g. of unadjusted powdered Calgon in distilled water to give 100 ml. of solution. The iron and phosphate solutions were mixed quickly in a blender.

The ferripolyphosphate solution precipitated practically all the protein in commercial acid whey at pH 3.2-4.0. The typical whey protein precipitate contains 22% protein, 12% iron, 39% P_2O_5, and 5% calcium. The lyophilized protein product is white and fluffy, and has a mildly acidic flavor. The authors suggest that ferripolyphosphate appears to be a useful reagent for the recovery of nutritious proteins from whey. Also, the proteins can be obtained in a form containing 12-15% iron (useful for enrichment of foods with iron).
[3 figures, 4 tables, 10 references] FTP

0.7 THE ECONOMIC IMPLICATIONS OF MALNUTRITION: THE DISMAL
(9.2) SCIENCE REVISITED

Belli, Pedro (Present address: Instituto Centroamericano de Administracion de Empresas, Managua, Nicaragua)
Economic Development and Cultural Change 20, No. 1, 1-23 (Oct. 1971)

The author's purpose, in thisarticle, was to point out the economic implications of malnutrition in the hope of generating research in this area. In his analysis, he concludes that the nutritional level of a country may have important consequences for its rate of economic growth. Suggested areas of research include (1) assuming that there are diminishing returns to nutrition, at what point do the marginal costs surpass marginal benefits, (2) what alternatives should be selected in the distribution of limited food resources, and (3) what kind of foreign aid should be given.
[1 figure, 7 tables, 37 references, appendix] FTP

The author describes a settling tank system for handling wastes from a trout farm. [6 figures, 1 illustration] FTP

Jensen, Raymond (Bureau of Sports Fisheries and Wildlife, U.S. Department of the Interior, St. Paul, MN 55101)
American Fishes and U.S. Trout News 16, No. 5, 4-6, 21 (Jan.-Feb. 1972)

0.8 TAKING CARE OF WASTES FROM THE TROUT FARM
(9.16)

1.0116 HISTORY AND STATUS OF NORTH CAROLINA'S MARINE FISHERIES

Godwin, Walter F., Michael W. Street, and Thomas R. Rickman
North Carolina Department of Conservation and Development, Division of Commercial and Sports Fisheries, Raleigh, N.C., Information Series No. 2, 77 pp. (July 1971). Available from the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22151. Order No. COM-72-10083.
NOAA Publications Announcement No. 72-5, Item 72-05-16-08, 6 (Feb. 1972)

Commercial and sports fishing are reviewed and a management philosophy is given. Marine Research organizations are briefly described, and important marine fisheries research is briefly reviewed. The Oyster Rehabilitation Program is described and assessed. Four major problem areas (habitat, stocks, products, people) are defined. (Authors' abstract, mod. by SK) Reprinted

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Existing information on species composition, distribution, and availability of commercially important bottom fishes found on the Continental Shelf was compiled and evaluated. (Authors' abstract in part) Reprinted

Bearden, Charles M., and Michael D. McKenzie
Technical Report No. 2, 19 pp. (May 1971) (South Carolina Wildlife Resources Department, Marine Resources Division, Charleston, S.C.) Available from the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22151. Order No. COM-72-10053.
NOAA Publications Announcement No. 72-5, Item 72-05-16-02, 4 (Feb. 1972)

1.0116 AN INVESTIGATION OF THE OFFSHORE DEMERSAL FISH RESOURCES OF SOUTH CAROLINA

0.7 (9.19) SELENIUM: RELATION TO DECREASED TOXICITY OF METHYLMERCURY ADDED TO DIETS CONTAINING TUNA

Ganther, H. E. (Department of Nutritional Sciences, University of Wisconsin, Madison, WI 53706), C. Goudie, M. L. Sunde, M. J. Kopecky, P. Wagner, Sang-Hwan Oh, and W. G. Hoekstra
Science 175, No. 4026, 1122-1124 (Mar. 10, 1972)

The authors report the surprising finding that tuna in the diet decreases the toxicity produced with high concentrations of methylmercury.

Tuna and swordfish are able to accumulate mercury in excess of 0.5 p.p.m. (the maximum level allowable in such fish used for food). This tendency on the part of these fish raised two questions in the authors' minds: (1) How toxic is a low concentration of Hg when ingested with the tuna? and (2) What factors present in tuna might cause Hg to accumulate or might modify its toxicity? The researchers are engaged in a study of the long-term effects of various concentrations of Hg in diets containing tuna. In the present experiments, they fed Japanese quail 20 p.p.m. of mercury (as methylmercury) in diets containing 17% by weight of tuna or in diets containing corn-soya. Control samples of both groups of diets contained no added methylmercury.

The authors found that Japanese quail given 20 p.p.m. of mercury in the diets containing the tuna survived longer than quail given the same amount of mercury in a corn-soya diet. Apparently, tuna has a relatively high content of selenium and tends to accumulate additional selenium when mercury is present.

In further tests with rats, the authors found that, when the selenium content in the diet was comparable to that supplied by tuna, the toxicity of methylmercury to the rats was lowered. They conclude that selenium in tuna, far from being a hazard in itself, may lessen the danger to man of mercury in tuna.
[1 figure, 1 table, 13 references] FTP

1.0118 PROBLEMS, PRIORITIES, AND RESEARCH NEEDS OF NORTH CAROLINA'S MARINE FISHERIES

Godwin, Walter F., Michael W. Street, and Thomas R. Rickman
North Carolina Department of Natural and Economic Resources, Division of Commercial and Sports Fisheries, Raleigh, N.C., Information Series No. 4, 41 pp. (July 1971). Available from the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22151. Order No. COM-72-10084.
NOAA Publications Announcement No. 72-5, Item 72-05-16-14, 7 (Feb. 1972)

Four major problem areas are defined: habitat, stocks, products, and people. Specific problems in each area are given and research needs presented. Priorities are established for needed research in each problem area, and the agencies best suited to conduct the research are suggested. Plans, including general objectives and methods, annual time tables, and estimated costs are given for proposed research activities by the Division of Commercial and Sports Fisheries for the next 5 years. (Authors) Reprinted

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0.8 MOBILE CARRYING SYSTEMS FOR DEPOSITING LOADS ON THE OCEAN BOTTOM

Serrano, Francisco M. (Paris, France); assignor to Compagnie Francaise des Pétroles, Paris (pat.)
U.S. Patent 3,633,529
Official Gazette of the U.S. Patent Office 894, No. 2, 553 (Jan. 11, 1972)

This submarine delivery system carries and deposits heavy loads at precise locations on the ocean bottom. The control system may be entirely contained in the submarine or control signals may be supplied by a surface vessel linked to the submarine by an electronic power and communication cable. FTP

0.6 FACTORS INFLUENCING FLAVOUR REQUIREMENTS

Pannell, R. H. J. (White Tomkins Ltd.)
Food Manufacturing 47, No. 1, 37, 48 (Jan. 1972)

Although the main factor influencing the flavor requirements of a food is the consumers' preference, the author points out many technical factors that are also important. These other factors influence strongly the direction and growth of the food industries and the nature of their industrial research and development programs. The author indicates that new food processes are being held back only by the enormous cost of launching a new product, by inflation, and by the lack of investment brought about by a general lack of confidence in world trade. The author classifies some of the various factors that influence flavor requirements of foods as follows: (1) Growth of foreign travel, (2) Introduction of new raw materials, (3) Development of new processing techniques, (4) Demand for convenience foods, (5) Interest in "savouries" (snacks, meat pies, textured protein, smoked meats), (6) Lack of international agreement on flavor additives in foods, (7) Regulations relative to the safety of flavor and other additives, and (8) The development of "health foods." FTP

0.6 FLAVORING PROCESSES AND PRODUCTS

Katz, Ira (Elberon, NJ 07740), Christopher Giacino (Monmouth Beach, N.J.), Louis J. Strasburger (Elizabeth, N.J.), and Manfred H. Vock (West Orange, N.J.); assignors to International Flavors & Fragrances Inc., New York, N.Y. (pat.)
U.S. Patent 3,627,540
Official Gazette of the U.S. Patent Office 893, No. 2, 661 (Dec. 14, 1971)

Seafood flavor is imparted to foodstuffs by the addition of 2,4-pentadienal and, if desired, of an oxazoline. FTP

0.7 TOXIC FOODS AND UNBALANCED FEEDING PATTERNS

Tremolières, J.
Cah. Nut. Diet. 6, No. 3, 59-62 (1971) (In French)
BFMIRA Abstracts 25, No. 3, Abstract No. 841, 171 (Mar. 1972)

The author considers Man as living in symbiosis with his environment. His dependence on his environment for food means that material is consumed containing substances necessary to plants, bacteria, fungi and etc. but foreign and sometimes harmful to Man's metabolism. Substances foreign to human metabolism considered include heavy metals, elements homologous to elements normally present in the cells, enzyme system modifiers, membrane modifiers and substances capable of intervening in nuclear biosynthesis. Also considered are those substances that normally can be used by the tissues but which become toxic when ingested in large amounts (for example alcohol) and normal nutrients in which a disequilibrium is injurious (for example vitamins A and D). L.P. Reprinted

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0.8 PROCESS FOR CLEANING UP OIL SPILLS (9.19)

Kaiser, Robert (Cambridge, Mass.); assignor to Avco Corp., Cincinnati, Ohio (pat.)
U.S. Patent 3,635,819
Official Gazette of the U.S. Patent Office 894, No. 3, 1094 (Jan. 18, 1972)

Oil spills on open bodies of water are controlled by dispersing a hydrocarbon base ferrofluid containing an oil soluble, water insoluble, surfactant and a stable colloid of magnetic solids, and then using a magnetic field to attract and pick up the oil spill. FTP

2.11 THE LATEST METHODS OF CATCHING FISH

Burgess, John (reviewer)
Fishing News International 11, No. 3, 83 (Mar. 1972)

This article is a brief review of volume 3 of the book "Modern Fishing Gear of the World, Fish Finding, Purse Seining, and Aimed Trawling." The book is edited by Hilmar Kristjonsson (Fisheries Division, Food and Agriculture Organization of the United Nations, Rome, Italy). It consists of papers presented at the Third FAO Fishing Gear Congress in Reykjavik, Iceland, in 1970. The four parts consist of (1) Fish Finding, (2) Purse Seining, (3) Aimed Trawling, and (4) Fishing in the Future. It is for sale by Fishing News (Books) Ltd., 110 Fleet Street, London, EC4, England. The price is £14.50 plus 5 percent for postage. FTP

2.1121 MAKING AND MENDING NETS.

Buckingham, Harry
World Fishing 20, No. 11, 16-17 (November 1971)

Part Two: Braiding the Top and Bottom Panels
Part Three: Braiding the Wings. Ibid. No. 12, 24-25 (December 1971)

In these articles, the author describes, step-by-step, the braiding of a small trawl. FTP

2.12 A STUDY OF THE EFFECTS OF A COMMERCIAL HYDRAULIC CLAM DREDGE ON BENTHIC COMMUNITIES IN ESTUARINE AREAS

Godcharles, Mark F.
Technical Series No. 64, 51 pp. (July 1971) (Florida Department of Natural Resources, Marine Research Laboratory, St. Petersburg, Fla.) Available from the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22151. Order No. COM-72-10109.
NOAA Publications Announcement No. 72-6, Item 72-06-16-01, 7 (Feb. 1972)

A Maryland soft-shell escalator clam dredge, the R/V Venus, was used in a systematic sampling program to study its effects on representative bottom types (habitats) in Tampa Bay and to conduct clam exploration in Tampa and Boca Ciega Bays, the Cedar Keys area, and Tarpon Strings vicinity. Six experimental stations established in Tampa Bay were visually inspected and sampled with trynet before dredging and at various intervals after dredging. Benthic plug samples were taken at the final sampling. Sediment samples were also taken to assess textural changes by particle size analyses. Collected fauna were identified, counted, and, in most instances, measured. After more than a year no recolonization of sea grasses, Thalassia testudinum and Syringodium filiforme, occurred in any dredged area. Some regrowth of Caulerpa prolifera was observed 86 days after dredging. No increase of clam set was detected during the study. As a result of this sampling program, two modifications to the harvester are recommended to increase efficiency and retard substrate damage. It is also recommended that these harvesters be permitted to operate in Florida on a permit basis and be prohibited in grassy areas. (Author's abstract, mod. by SK) Reprinted

2.1475 (9.2) EXPERIMENTAL DRUM SEINING FOR WETFISH IN CALIFORNIA

Hester, F. J., D. A. Aasted (National Marine Fisheries Service, Southwest Fisheries Center, Honolulu,Laboratory, Honolulu, Hawaii 96812), and R. E. Green (NMFS, Tiburon Fisheries Laboratory, Tiburon, CA 94920)
Commercial Fisheries Review 34, Nos. 1-2, 23-32 (Jan.-Feb. 1972)

The authors consider the problem of operating a vessel profitably in a fishery for a fixed-price resource. They believe that more profit can be made by increasing the efficiency of vessel operation, thereby increasing landings, and by decreasing manpower through mechanization. In this study, purse-seining operations were mechanized by using a hydraulically powered drum to handle the net and a fish pump to load the fish. This increased operating efficiency by lessening time required to catch the fish--and by decreasing manpower required for the vessel operation. The experiments showed that the cost of mechanizing could be offset by recovery from the crew's share of the catch while increasing wages for the remaining crewmen. [5 figures, 3 tables, 4 references] Authors' abstract

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2.1475 MEANS AND METHOD FOR STRIPPING PURSE RINGS ON A PURSING LINE BEING HAULED IN

Whaley, Morris L. (Bonita, CA 92002) (pat.)
U.S. Patent 3,626,625
Official Gazette of the U.S. Patent Office 893, No. 2, 434 (Dec. 14, 1971)

Rings on a pursing cable of a purse seine are stripped or collected on a prong. FTP

2.3 VALVE, PUMP AND PIPE CONFIGURATION FOR C.I.P.

Lloyd, A. K. (A.P.V. Co., Crawley, Sussex, England)
Food Manufacture 47, No. 2, 37, 39, 41, 61 (Feb. 1972)

An efficient cleaning in-place (C.I.P.) installation in any industry involved in handling potable liquids should be considered along with product requirements at the design stage. This article deals with the basic principles of automatic safety configurations using pneumatic sanitary valves to provide efficient cleaning with total isolation of product from cleaning solutions. It also outlines the rules for pipe configuration. [5 figures] FTP

2.3 STAINLESS STEEL PIPEWORK REQUIREMENTS

Robinson, E. C. (Market Development, TI Stainless Steel Tubes Ltd., Tipton Road, Dudley, Worcs., England)
Food Manufacture 47, No. 2, 45, 47-48 (Feb. 1972)

The use of stainless-steel pipework in food processing plants is discussed. [2 illustrations] FTP

2.146 (2.116) INTERPRETATION OF ECHOGRAMS OF HYDROACOUSTIC FISH-FINDING INSTRUMENTS

Yudanov, K. I.
Izdatel'stvo "Pishchevaya Promyshlennost," Moskva 1967.
Translated by E. Vilim, Israel Program for Scientific Translations, Jerusalem, Israel (1971), iv + 101 pp. Available from the U.S. Department of Commerce, National Technical Information Service, Springfield, VA 22151.

This booklet deals with the basic principles of reading and interpreting echograms of hydroacoustic fish-finding instruments. The information is useful to the engineers, technicians, and mates serving the fishing fleets, and to biologists and oceanographers interested in the field of fish location. [60 figures, 10 tables, 74 references] FTP

2.9 TOXICOLOGICAL AND PHARMACOLOGICAL STUDIES ON SEA ANEMONE, CALLIACTIS POLYPUS (HORMATHIIDAE)

Huang, C. L., and G. N. Mir (Department of Pharmacology, School of Pharmacy, University of Mississippi, University, MS 38677)
Journal of Pharmaceutical Sciences 61, No. 1, 66-69 (Jan. 1972)

The toxin from the tentacles of C. polypus was toxic to mice, having an LD_{50} of 32 mg/kg. The toxin appears to have CNS (Central nervous system) depressant action and also it reduced the motor activity in mice. [2 figures, 1 table, 15 references] FTP

2.9 THE PROBLEM OF THE ORIGIN OF TROPICAL ICHTHYOSARCOTOXICITY

Ehrhardt, J.-P.
Annls Falsif. Expert. Chim. 64, No. 695, 100-114 (1971) (In French)
BFMIRA Abstracts 25, No. 3, Abstract No. 833, 170 (Mar. 1972)

The epidemiology of ciguatera and ciguatera-type intoxications (poisoning associated with the ingestion of certain seafoods) is discussed. C.C.E. Reprinted

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2.3 SHRIMP-DEHEADING MACHINE

Zober, Ben F. (1364 S. Edgewater Drive, Charleston, SC 29407), and Arthur G. Teston, Jr. (P.O. Box 181, Hollywood, SC 29449) (pat.)
U.S. Patent 3,629,904 (Dec. 28, 1971)

The machine is used for cutting off the heads of shrimp. FTP

2.143 SHARK DART ELECTRONIC CIRCUIT

Blanc, Clarence G. (Escondido, CA 92025); assignor to U.S. Secretary of the Navy) (pat.)
U.S. Patent 3,626,626
Official Gazette of the U.S. Patent Office 893, No. 2, 434 (Dec. 14, 1971)

The device couples an immobilizing electromotive force to the interior of a marine predator's body via a pathway between a bladelike electrode embedded in the predator's body, ambient sea water, and a return electrode. FTP

2.1121 MAKING AND MENDING NETS. PART FOUR: FINISHING THE WINGS AND BEGINNING ASSEMBLY

Buckingham, Harry
World Fishing 21, No. 1, 18-19, 25 (Jan. 1972)

Parts 1, 2, 3 (Make Yourself a 36 Ft. Headline Small Boat Trawl) appeared in the October, November, and December issues of this journal. The present article (Part 4) describes the finishing of the net wings and the beginning assembly of the sections of the net. [4 figures] FTP

2.1477 FISH LINE REELING AND BAITING APPARATUS

Tison, Kenneth F. (Crescent City, CA 95531); assignor to Marine Construction Design Co., Seattle, Wash. (pat.)
U.S. Patent 3,626,630
Official Gazette of the U.S. Patent Office 893, No. 2, 435 (Dec. 14, 1971)

This is a semi-automatic line handling and baiting system for commercial fishing. FTP

2.1477 TROTLINE RUNNER

Osborne, Twin W. (Del City, Okla.); assignor of fractional part to Raymond E. Theimer, Oklahoma City, Okla.) (pat.)
U.S. Patent 3,626,627
Official Gazette of the U.S. Patent Office 893, No. 2, 434 (Dec. 14, 1971)

2.1477 WEED-PROOF FISHHOOK

Lowery, William H. (Utica, NY 13501) (pat.)
U.S. Patent 3,626,629
Official Gazette of the U.S. Patent Office 893, No. 2, 435 (Dec. 14, 1971)

The fishhook has a long shank bent at a right angle. FTP

2.43 FISH PACKAGING

Knutrud, L. B.; Frionor Norsk Frossenfisk A/L (pat.)
U.S. Patent 3,615,720
Food Technology 26, No. 2, 60 (Feb. 1972)

Packaged fillets are subjected to vacuum treatment to remove air voids between the fillets. FTP

3.2493 (4.6) EFFECTS OF SOME ANTIOXIDANTS AND EDTA ON THE DEVELOPMENT OF RANCIDITY IN SPANISH MACKEREL (SCOMEROMORUS MACULATUS) DURING FROZEN STORAGE

Farragut, Robert N. (Fishery Products Laboratory, National Marine Fisheries Service, Pascagoula, MI 39567)
NOAA Technical Report NMFS SSRF-650, 12 pp. (Feb. 1972) (National Marine Fisheries Service, Washington, DC 20235) For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Stock No. 0320-0032, Price $0.25.

Spanish mackerel were treated with antioxidant solutions containing BHA and BHT (Tenox 4); BHA, BHT, PG, citric acid, and propylene glycol (Tenox 6); Tenox 4 plus EDTA; Tenox 6 plus EDTA; $Ca(Na)_2EDTA$; $(Na)_2FDTA$; $(Ca)_2EDTA$; and $(Na)_4EDTA$ both by dipping and injecting methods. Samples analyzed at 3-month intervals showed fillets packed in vacuum and treated with EDTA remained in good condition over the 12-month storage period. However, samples treated with $(Na)_4EDTA$ remained superior to other samples throughout the storage period.
[6 figures, 12 tables, 7 references] Authors' abstract

3.4 SMOKE EXTRACT. PROPERTIES, PRODUCTION TECHNOLOGY AND APPLICATION

Miler, K. B. M., and Z. P. Kozlowski
Rev. Conserve 28, No. 2, 122-126 (1971) (In French)
BFMIRA Abstracts 24, No. 6, Abstract No. 1751, 366 (June 1971)

The toxicity trials on a patented Polish smoke extract, the antioxidant properties of the product and the manufacture and applications of the product are reported in some detail. The active components of the extract are those having an active phenolic group. Evidence of the extract's lack of polycyclic hydrocarbons of a carcinogenic nature is also presented. C.C.E. Reprinted

3.336 FULLY AUTOMATIC RETORT CONTROL SYSTEMS

Hughes, P. (Taylor Instrument Companies (Europe) Ltd.)
Food Manufacture 47, No. 2, 27-28, 31-32, 61 (Feb. 1972)

This is the third article in a series dealing with the retorting process. The previous two articles were published in the November and the December 1971 issues of this journal. They discussed the instrumentation techniques for each stage of the retorting process necessary to ensure that the correct processing is carried out. In the present article, the author discusses the instrumentation that can be considered in fully automatic retort control systems. He defines fully automatic retort control systems as those systems in which operator participation is confined to loading and unloading the retort and to initiating the retorting process by actuating a simple push button (after the operator has checked that the controlling parameters--temperature, pressure, cook hold time, and cool time--are at the correct settings on the instrumentation). The various sections of the article deal with Operation of the retort, Equipment used, Instrument presentation, Process variations, Continuous cookers, Aseptic canning, and Advantages for instrumentation. [16 figures] FTP

4.19 DIOL LIPIDS. XXI: THE HIGH ETHYLENEGLYCOL CONTENT OF MARINE INVERTEBRATE LIPIDS

Vaver, V. A., N. A. Pisareva, and L. D. Bergelson (Institute for Chemistry of Natural Products, Academy of Sciences, Moscow, U.S.S.R.)
Chemistry and Physics of Lipids 8, No. 1, 82-86 (Jan. 1972)

Diol lipids (fatty acid or alkyl derivatives of dihydric alcohols) may exist as minor components in various animal, plant, and microbial lipids. No organisms have been found whose diol lipids under ordinary conditions constitute a major portion of the overall lipid content. In this article, the authors present data to show that some marine invertebrates of the Echinodermata and Mollusca families have diol lipid contents comparable with or even exceeding those of the neutral glycerolipids.
[2 figures, 1 table, 9 references] FTP

3.6 DEHYDRATION OF FOOD PRODUCTS. A REVIEW

Holdsworth, S. D. (Fruit and Vegetable Preservation Research Association, Chipping Campden, Gloucestershire, England)
Journal of Food Technology 6, No. 4, 331-370 (December 1971)

This review covers the physical aspects of drying food products and their significance in the preservation of the organoleptic properties of the food. It is limited to material not covered in previous reviews and contains the more recent information, as well as an extensive bibliography. References to earlier literature on dehydration are given in E. A. Baker and D. J. Foskett "Bibliography of Food," Butterworths Scientific Publication, London (1958); supplementary information is given in W. H. Bickle "Bibliography of Industrial Drying," (3 volumes) (696 references to Food), D.S.I.R., H.M.S.O., London. A bibliographical guide was prepared by the present author (S. D. Holdsworth, "Bibliographical Guide to Dehydration and Dehydrated Products," F.V.P.R.A., Chipping Campden, Glos.). The author further indicates that the major text books on dehydration of foods are: H. W. Von Loesecke, "Drying and Dehydration of Foods," 1st edition (1943), 2nd edition (1945), Reinhold Pub. Corp., New York; T. N. Morris, "Dehydration of Food," Chapman and Hall, London (1947); and W. B. Van Arsdel and M. J. Copley (editors) "Food Dehydration," Vol. 2. Products and Technology, AVI Pub. Co. Inc., Westport, Conn. (1964). An important theme of this review is the usefulness of the basic study of the transport process [heat transfer, mass transfer (moisture diffusion), and momentum transfer (fluid flow)] in relation to the design, development, and operation of processing equipment.
[1 figure, 2 tables, 298 references] FTP

3.15 (7.9) A TECHNIQUE FOR THE DETECTION OF LOW DOSE γ-IRRADIATION IN COOKED DUTCH SHRIMP (CRANGON CRANGON) BY DISC PROTEIN PATTERNS

Adriaanse, A. (Agricultural University, Department of Food Science, Wageningen, Netherlands)
Journal of the Science of Food and Agriculture 22, No. 9, 498-499 (Sept. 1971)

The purpose of this study was to develop a method to distinguish between irradiated and unirradiated shrimp. In these experiments, cooked, peeled shrimp were irradiated in an air environment at levels of 50, 100, and 300 krad. Disc electrophoresis patterns of the salt-extracted proteins of the shrimp samples showed a series of radiocharacteristic effects. The author developed a method for detecting low-dose irradiation of shrimp based on the disc pattern effects. Furthermore, it was possible to estimate the level of the applied dose.
[1 figure, 13 references] FTP

3.17 SHELLFISH PRESERVATION

Kosuge, K., K. Yamauchi, and T. Nakamura (pat.)
Japanese Patent 29185/71
Food Technology 26, No. 1, 81 (January 1972)

The shellfish are preserved by treating them with cold water or ice at a pH of from 7.8 to 9.8. FTP

4.5 MICROSOMAL LIPID PEROXIDATION: MORPHOLOGICAL CHARACTERIZATION

Arstila, A. V., Mary A. Smith, B. F. Trump (Department of Pathology, University of Maryland School of Medicine, Baltimore, MD 21201)
Science 175, No. 4021, 530-533 (February 4, 1972)

Various workers have shown earlier that lipid peroxidation occurs, in vitro, when liver mitochondria or microsomes are incubated in the presence of redox agents such as ferrous ions, mercurial compounds, hemoproteins, ascorbate, and cystamine. The morphological alterations that occur in peroxidation have not been characterized. Such information would help us to understand the pathogenesis of peroxidation lesions and would provide new means for detecting lipid peroxidation in intact tissues, in which lipid peroxidation end products may be rapidly metabolized. The present authors, therefore, studied the morphological alterations which occur in microsomes during in vitro peroxidation. For this study, they used the hepatic microsomal fraction, in as much as the endoplasmic reticulum is especially vulnerable to peroxidation (because it contains an electron-transfer system that can catalyze lipid-peroxidation reactions).

The researchers found that lipid peroxidation of liver and kidney microsomes induces a highly characteristic sequence of morphological changes typified by detachment of ribosomes and formation of large aggregates of vesicles bound together by dense amorphous material and myelin figurelike debris. Further, the trilaminar structure of the membrane is retained even after complete peroxidation, although its spacing may be increased. They indicate that the aggregates resemble lysosomal lipofuscin pigment as well as the membraneous aggregates of endoplasmic reticulum seen in the liver after carbon tetrachloride poisoning.
[3 figures, 27 references] FTP

3.2342 (0.8) PROTOTYPE DEVELOPMENT OF AN IMMERSION FREEZER FOR FANCY MEATS IN MONOPROPYLENE GLYCOL

Frazerhurst, L. F., D. P. Haughey, and L. G. Wyborn (Meat Industry Research Institute, New Zealand)
Refrigeration and Air Conditioning 75, No. 887, 51, 52, 54, 55, 57 (Feb. 1972)

This paper contains a description of the design, development, and testing of a prototype plant of an automatic packaging and immersion freezing system for encapsulated portion-controlled units of fancy meats. The portion-control units are packaged in tight moisture and freezing medium impermeable film. Strips of the packaged units are frozen in a 50% solution of monopropylene glycol.

The authors present data on heat transfer coefficients, freezing times, and optimum processing conditions. The economics of the process was evaluated. The data indicated that there was only a marginal increase in total cost for this new process as compared to conventional processes. The authors state that the process has considerable potential and is worthy of commercial development.
[8 figures, 3 tables] FTP

3.2383 MINIMUM REQUIREMENTS OF FOOD PACKAGES (FISH)

Heiss, R.
Verpack.-Rdsch. 21, No. 9, Techno-scientific suppl., p. 71 (1970) (In German)
RFMIRA Abstracts 24, No. 6, Abstract No. 1845, 381 (June 1971)

"Recommendations are given for the portion packaging of deep-frozen fish under the headings of general requirements of the package, particular susceptibilities, specific requirements of the package, experience with existing packages used in the industry, and preservation of the packaged product." Reprinted

6.190 COMPARATIVE STUDIES ON THE NUTRITIVE VALUE OF DOMESTIC AND IMPORTED FISH MEAL IN BROILER RATIONS

Han, I. K., K. I. Kim, and N. H. Lee
K. J. Animal Science 13, No. 1, 56-60 (1971)
Korean Scientific Abstracts 6, No. 1, Item (71/622), 182 (Dec. 1971)

In tests with broiler chicks, the authors found no difference between domestic and imported meals when judged on the basis of growth rate of the chicks. The moisture content of the domestic meal was over twice that of the imported meal. [Original article has 2 figures, 6 tables, 13 references] FTP

4.11 GAS-LIQUID CHROMATOGRAPHIC FRACTIONATION OF NATURAL DIGLYCERIDES ON STABILIZED POLYESTER LIQUID PHASES

Kuksis, A. (Banting and Best Department of Medical Research, University of Toronto, Toronto 101, Canada)
Journal of Chromatographic Science 10, No. 1, 53-56 (Jan. 1972)

The researchers were able to resolve 1,2(2,3)-diglyceride mixtures according to their molecular weight and degree of unsaturation by gas chromatography on 180 cm. columns containing 3% cyclohexanedimethanol succinate or 3% neopentylglycol succinate in the packing. [2 figures, 1 table, 10 references] FTP

6.32 FATTY ACID COMPOSITION OF UNICELLULAR STRAINS OF BLUE-GREEN ALGAE

Kenyon, C. N. (Department of Bacteriology and Immunology, University of California, Berkeley, CA 94720)
Journal of Bacteriology 109, No. 2, 827-834 (Feb. 1972)

The chloroplast fatty acids of eukaryotic algae and of vascular plants are mostly polyenoic acids; α-linolenic acid (18:3α) is found almost exclusively in chloroplasts and is a major constituent in the leaf tissues of higher plants and in certain groups of algae [B. W. Nichols, in Phytochemical Phylogeny, J. B. Harbourne (editor), Academic Press, Inc., New York, N.Y. (1970), pp. 105-118] The bacteria (including the purple and green bacteria) contain almost exclusively saturated fatty acids and monounsaturated fatty acids in their cellular lipids. The author carried out the present study on the nature of cellular fatty acids of blue-green algae as a matter of comparative biochemical interest.

The fatty acids of 34 strains of unicellular blue-green algae provisionally assigned to the genera Synechococcus, Aphanocapsa, Gloeocapsa, Microcystis, and Chlorogloea were chemically characterized. Twenty strains fell into the group characterized by one trienoic fatty acid isomer (α-linolenic acid); seven strains fell into a group characterized by another trienoic acid isomer (γ-linolenic acid). All the strains contained glycolipids with properties of mono- and digalactosyldiglycerides. [8 tables, 27 references] FTP

7.47 GAUGING RESIDUAL HEADSPACE OXYGEN

Spiehler, Vina (Scientific Instruments Division, Beckman Instruments, Inc., Fullerton, Calif.)
Modern Packaging 45, No. 3, 46, 48, 50, 52, 54 (Mar. 1972)

A new system for the simple, rapid and accurate measurement of oxygen in the headspace of packages is described. Whole packages, with or without product, can be tested. The system does not require specially constructed chambers or sampling systems. The system consists of a precision oxygen analyzer and built-in low-volume sampling accessory. Additional accessories are used to sample headspace in a variety of containers. A paramagnetic oxygen analyzer is used as the detector; it allows precise determination of oxygen concentrations in the presence of other gases. The system requires a small internal volume (4 cc.) and it is highly precise (0.5% oxygen). Greater precision may be obtained by using another model of the oxygen analyzer. [3 figures, 3 tables, 6 references] FTP

6.54 FISH PASTE PRESERVATION
(3.12)

Horikawa, H., S. Kurihura et al. (pat.)
Japanese Patent 30779/71
Food Technology 26, No. 1, 81 (January 1972)

Crushed fish meat is pressed at a temperature below 50° C. and the juice obtained is boiled to coagulate insoluble protein. The resultant liquid component is added to fish paste products. FTP

6.54 FISH FLOUR PRODUCT

Salomon, A. (pat.)
Canadian Patent 882,620
Food Technology 26, No. 1, 81 (January 1972)

Protein rich foods are prepared from fish flour. FTP

6.32 PROTEIN QUALITY OF SOME FRESH-WATER ALGAE

Schlichting, Harold E., Jr. (Botany Department, North Carolina State University, Raleigh, NC 27607)
Economic Botany 25, No. 3, 317-319 (July-September 1971)

Fresh-water algae are not, at present, of economic value as fertilizer or as food for livestock or humans. However, fast growing algae mass cultured in sewage, pulped garbage, or other wastes for the production of protein or other organic compounds may be important in the future. In this article, the author reports on the content of 19 amino acids in five species of fresh-water green algae (Pithophora sp., Pediastrum sp., Cylindrocystis brebissonii, Staurastrum cristatum, and Mesotaenium kramstai).
[2 tables, 18 references] FTP

7.1 CHITIN AND CHITOSAN AS CHROMATOGRAPHIC SUPPORTS AND ABSORBENTS FOR COLLECTION OF METAL ION FROM ORGANIC AND AQUEOUS SOLUTIONS AND SEA WATER

Muzzarelli, Maria Gertrude (Nee Weckx, Casella Postale 693, Bologna 40100, Italy) (pat.)
U.S. Patent 3,635,818
Official Gazette of the U.S. Patent Office 894, No. 3, 1093 (January 18, 1972)

Chitin is used as a chromatographic chelating support and absorbent for the collection and for the separation of the metal ions from aqueous and organic solutions and from sea water. FTP

7.42 THE DETERMINATION OF MERCURY BY ATOMIC-ABSORPTION SPECTROPHOTOMETRY WITH THE "DELVES SAMPLING CUP" TECHNIQUE

Clark, D., R. M. Dagnall, and T. S. West (Department of Chemistry, Imperial College of Science and Technology, London, S.W. 7, England)
Analytica Chimica Acta 58, No. 2, 339-346 (Feb. 1972)

The researchers evaluated the use of the absorption tube and crucible method of atomization [H. T. Delves, Analyst 95, 431 (1970)] for the atomic-absorption determination of mercury in small sample volumes. A double absorption peak was obtained for mercury. The limit of detection of mercury with a 5-µl. sample volume and a triple-row capillary hydrogen diffusion flame was 0.17 ng.
[3 figures, 1 table, 18 references] FTP

7.42 IDENTIFICATION AND DETERMINATION OF METHYL MERCURY COMPOUNDS
(9.19) IN FISH BY USING COMBINATION GAS CHROMATOGRAPH-MASS SPECTROMETER

Johansson, B., R. Ryhage, and G. Westoo
Acta chem. scand. 24, No. 7, 2349-2354 (1970)
BFMIRA Abstracts 24, No. 11, Abstract No. 3568, 725 (November 1971)

A description of the method is given. H.M.S. Reprinted

6.54 FISH FLAVOR IMPROVEMENT

Kikatsu Shoten KK; Hiroshima Shoyo KK (pat.)
Japanese Patent 29186/71
Food Technology 26, No. 1, 81 (January 1972)

Naturally brewed soy (heated to inactivate protease) is added to fish paste products to improve their odor and flavor. FTP

6.37 CHLORELLA EXTRACT

Chlorella Inc. Co. Ltd. (pat.)
Japanese Patent 24596/71
Food Technology 26, No. 1, 84 (January 1972)

An aqueous extract of chlorella duckweed is boiled and the precipitated protein is removed. The liquid component is added to salt and the mixture is dried. FTP

7.42 DETERMINATION OF MERCURY BY ATOMIC ABSORPTION SPECTROPHOTOMETRY

Cumont, G.
Annls Falsif. Expert. Chim. 64, No. 695, 115-133 (1971) (In French)
BFMIRA Abstracts 25, No. 3, Abstract No. 685, 140 (Mar. 1972)

The main part of the article is concerned with a description of two methods of determining mercury by atomic absorption spectrophotometry. The first method uses electrolysis to liberate the mercury from solutions. The second method uses reduction by stannous chloride to liberate the mercury. The results obtained using the two methods are discussed and it is recommended that the reduction method be used for analysis of biological materials when the sample size is not limited and that the electrolysis method be employed when only micro-quantities are available. C.C.E. Reprinted

7.42 DETERMINATION OF MERCURY IN FOODS, INDUSTRIAL WASTES, AND DRINKING WATER BY FLAMELESS ATOMIC ABSORPTION

Cavalliaro, Aldo, Giuseppe Elli (Lab. Chim. Prov. Milano, Milan, Italy)
Chemical Abstracts 76, No. 8, 41528r (Feb. 21, 1972)

7.522 (8.51) DETERMINATION OF NANOMOLAR QUANTITIES OF FREE AMINO ACIDS DISSOLVED IN NORTH ATLANTIC OCEAN WATERS

Pocklington, Roger (Atlantic Oceanographic Laboratory, Bedford Institute, Dartmouth, Nova Scotia, Canada)
Analytical Biochemistry 45, No. 2, 403-421 (Feb. 1972)

In this paper, the author describes a new gas-chromatographic method for determining amino acids that gave complete separation of small samples quickly and quantitatively. He used a one-step reaction, trimethylsilylation, to prepare volatile derivatives for injection in the gas chromatograph. Conditions are described for the detection of as little as 10^{-11} mole of all the protein amino acids, except arginine and histidine, plus many nonprotein amino acids. Although the techniques were developed to determine dissolved free amino acids of sea water, the author believes that the techniques are more widely applicable (for example, to the determination of amino acids in plasma and urine).

The paper contains data on the concentrations of 15 individual amino acids in North Atlantic Ocean water samples taken from the surface to a depth of 5,400 meters. The concentrations of the individual amino acids were nonuniform and showed statistically significant variations with depth.
[2 figures, 7 tables, 29 references] FTP

7.9 GAS-CHROMATOGRAPHIC DETERMINATION OF MONOSODIUM GLUTAMATE IN FOOD PRODUCTS

Gál, S., and P. Schilling (Mitteilung ans der Forschungsabteilung der Firma Haco AG, Gümlingen, Switzerland)
Zeitschrift für Lebensmittel-Untersuchung und-Forschung 148, No. 1, 18-22 (Jan. 1972) (In German)

This paper describes a method for determining monosodium glutamate in foodstuffs by means of gas chromatography. The method involves extraction of the glutamate in water, purifying it on an ion-exchange column, then determining it as the N-trifluoroacetic-n-butylester derivative of the l-glutamic acid.
[2 figures, 3 tables, 9 references] FTP

7.53 COMPARATIVE ANALYSIS OF THE RESULTS OF DETERMINATION OF LIPIDS IN FISHES BY THE METHODS OF SOXHLET AND FOLCH

Shabalina, A. A. (Laboratory of the Physiolcgy of Fishes, State Research Institute for Lake and River Fisheries, Leningrad, U.S.S.R.)
Journal of Ichthyology 11, No. 1, 85-88 (1971) (Published by the American Fisheries Society in cooperation with Scripta Publishing Corp., 1511 K Street, N.W., Washington, DC 20005)

Comparison was made of the determination of total lipids of fishes by the method of Soxhlet [S. V. Rushkovskiy, Tr. Kubano-Chernomorsk. n.-i. inst., No. 48 (1927)] and the method of Folch (J. Folch, J. Ascoli, M. Lees, J. A. Meath, and F. N. le Baron, "Preparation of lipide extracts from brain tissue," J. Biol. Chem. 191, No. 2, (1951)]. The author found no significant differences in results obtained by both methods for the total fat content of trout underyearlings and yearlings. However, he states that the method of Folch must be used for the determination of lipid in fish organs and fish tissues (muscles, liver, blood serum, eggs, embryos). [3 tables, 17 references] FTP

8.42 (9.19) TENEUR EN MERCURE DANS QUELQUES POISSONS DE CONSOMMATION COURANTE [CONTENT OF MERCURY IN SOME FISHES GENERALLY CONSUMED]

Thibaud, Yves
Science et Pêche, No. 209, 1-10 (Dec. 1971) (In French) (Bulletin D'Information et de Documentation de L'Institut Scientifique et Tehnique des Pêches Maritimes, La Noë, Route de la Jonelière- 44 Nantes, France)

Data are given on the mercury content of fresh and frozen fish and of canned tuna. [3 figures, 3 tables, 1 reference] FTP

7.595 A METHOD FOR EXAMINATION OF THE DISTRIBUTION OF CITRATE IN BALTIC HERRING FILLETS KEPT IN SALINE SOLUTION

Kuusi, T., and R. Kytökangas
Lebensm.-Wiss. & Technol. 4, No. 1, 1-6 (1971) (In English)
BFMIRA Abstracts 24, No. 6, Abstract No. 1700, 356 (June 1971)

Citrate is added to fish to protect the proteins when frozen or salted. The fillets were allowed to stand in saline solution containing citrate for up to 5 days and the diffusion of citrate throughout the fillets was followed by the use of ^{14}C citrate. The citrate was distributed quite widely after 5 days with localization at the muscle surface. It was suggested that this had a bearing on the protective effect of citrate (prevention of a decrease in the water-binding capacity). C.S.B. Reprinted

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7.9 (6.19) THE PRECISION OF MEASURING METABOLIZABLE ENERGY IN POULTRY FEEDSTUFFS

Potter, L. M. (Department of Poultry Science, Virginia Polytechnic Institute and State University, Blacksburg, VA 24060)
Feedstuffs 44, No. 13, 28-29, 40 (Mar. 27, 1972)

This paper considers the precision in measuring the metabolizable energy values of feedstuffs in poultry rations. The author discusses the determination of and calculations for the metabolizable energy of a diet; the calculations for metabolizable energy of a feed ingredient; the analytical variation in metabolizable energy determination; the variation in metabolizable energy values of a diet attributable to laboratory analyses; the experimental variation found in metabolizable energy determination of diets; and the effect of level of ingredient substitution on the variation in the metabolizable energy determination of the ingredient.

The author believes that metabolizable energy values of diets and feed ingredients have been and can continue to be evaluated with considerable accuracy and precision through proper design and replication of experiments. Data on metabolizable energy values are valuable for efficient application of feed ingredients in commercial poultry rations.
[1 figure, 8 tables, 7 references] FTP

7.53 A PROCEDURE FOR THE MEASUREMENT OF FATS IN FOODS

Southgate, D. A. T. (Dunn Nutritional Laboratory, University of Cambridge and Medical Research Council, Milton Road, Cambridge, England)
Journal of the Science of Food and Agriculture 22, No. 11, 590-591 (Nov. 1971)

The author developed a rapid and reproducible procedure for the determination of fat in foodstuffs based on extraction of the foodstuff with a mixture of chloroform and methanol. [1 table, 15 references] FTP

7.8 STANDARDISATION OF ORGANOLEPTIC TERMS

Anonymous
Food Manufacture 47, No. 2, 12 (Feb. 1972)

The British Standards Institution has prepared a draft for comment of their "Glossary of Terms Relating to Sensory Analysis." Copies are available from the Institution at 2 Park St., London W1A 2BS, England. The reference number is 71/55224. FTP

7.53 DOSAGE RAPIDE DES MATIERES GRASSES DU POISSON [RAPID DETERMINATION OF FATTY MATERIAL IN FISH]

Durand, Henri
Science et Pêche, No. 209, 11-13 (Dec. 1971) (In French)
[1 figure, 1 table, 4 references]

8.42 (9.19) MERCURY IN FISH. II. TOTAL MERCURY CONTENT IN FRESHWATER AND MARINE FISHES

Greve, P. A., and S. L. Wit (Rijksinst. Volksgezond., Bilthoven, Netherlands)
Chemical Abstracts 76, No. 1, 262Zx (Jan. 3, 1972)

7.8 NEW METHODS FOR THE EVALUATION AND INTERPRETATION OF SENSORY QUALITIES OF FOODSTUFFS AND FOR THE FORECASTING OF THEIR CHANGES. III. ON PROBLEMS CONCERNED WITH SCALES FOR GRADING

Herrmann, J.
Nahrung 15, No. 8, 837-857 (1971) (In German; English summary)
BFMIRA Abstracts 25, No. 3, Abstract No. 1043, 209 (Mar. 1972)

Mathematical formulae are used to correlate values for the stimulating effect of various light intensities and concentrations on odour and flavour components with the relevant degrees of sensitivity. The validity of these equations is proved. C.S.B. Reprinted

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7.53 A NEW RAPID METHOD FOR MEASURING THE FAT CONTENT IN MEAT AND MEAT PRODUCTS

Moreau, J. R., and J. Gaihlat
Can. Inst. Fd Technol. J. 4, No. 4, 154-158 (1971)
BFMIRA Abstracts 25, No. 3, Abstract No. 684, 140 (Mar. 1972)

The new rapid method presented involves heating samples of ground raw or cooked samples of meat or meat products in an alkaline solution which allows separation of the fat portion. The fat is measured in graduated volumetric bottles. Results using this method were compared with those obtained on the same products by the Goldfisch ether method and Salwin's modified Babcock method. S.M.S. Reprinted

8.50 CAROTENOIDS IN FISH. I. CAROTENOIDS IN THE EGGS OF ACIPENSER RUTHENUS RUTHENUS L. (ACIPENSERIADAE) FROM THE DANUBE

Czeczuga, B. (Department of Biology, Bialystok Medical Academy, Bialystok, Poland)
Hydrobiologia 39, No. 1, 9-16 (Jan. 31, 1972)

Fish assimilate carotenoids with their food and these carotenoids are then deposited in various organs in an oxygenized form. Often the carotenoids are accumulated in large amounts in the external parts of the fish giving them a different coloration. No data on the presence of carotenoids in Acipenseridae appear in the literature; therefore, the author carried out a study to provide this information. Unfertilized eggs of the A. ruthenus ruthenus L. were used in the test. They were obtained from six specimens caught in the Danube River near Galati, Rumania, in April 1970. For comparison purposes, analysis was also carried out on the eggs of the Acipenseridae from the waters of the Soviet Union--these eggs are known as "caviar." Column and thin-layer chromatography methods were used to identify the carotenoids.

β-Carotene, astaxanthin ester, tunaxanthin, lutein, and zeaxanthin were found in the eggs of the A. ruthenus ruthenus L. Isozeaxanthin, astaxanthin ester, lutein, zeaxanthin, taraxanthin, and astaxanthin were found in the "caviar."
[2 figures, 1 table, 28 references] FTP

9.11 (8.4) PROCESSING EASTROPAC STD DATA AND THE CONSTRUCTION OF VERTICAL TEMPERATURE AND SALINITY SECTIONS BY COMPUTER

Miller, Forrest R. (Inter-American Tropical Tuna Commission, La Jolla, CA 92037), and Kenneth A. Bliss (Southwest Fisheries Center, National Marine Fisheries Service, La Jolla, CA 92037)
NOAA Technical Report NMFS CIRC-365, iv + 17 pp. (Feb. 1972) (National Marine Fisheries Service, NOAA, U.S. Department of Commerce, Seattle, WA 98115) For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Price $0.30.

During the EASTROPAC expeditions the STD (salinity-temperature-depth recorder) was established as the principal instrument for obtaining detailed profiles of temperature and salinity to depths exceeding 1,000 m. The STD system recorded data in digital form on magnetic tape and required computer processing to provide accurate temperatures and salinities at 1-m intervals for each hydrographic station.

Procedures for processing STD data from pre-processed digital logger tapes are described. Also included is a discussion of processing temperatures and salinities from the STD analog charts or from Nansen cast data when the digital data logger was not operative. Essential calibration of STD data from Nansen cast data is outlined. Finally, a computer program which prepares a final, annotated STD tape, with corrected temperatures and salinities, is described in great detail.

Another computer program was developed to provide for the EASTROPAC Atlas representative vertical sections of temperatures and salinities extracted from the final STD tapes. Details of computer methods employed to analyze and contour STD

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9.1 MAN AND THE BIOSPHERE: AN INTERNATIONAL RESEARCH PROGRAMME

Batisse, Michel (Division of Natural Resources Research, UNESCO, Place du Fontenoy, Paris 7e, France)
Biological Conservation 4, No. 1, 1-6 (Oct. 1971)

The new international research program entitled Man and the Biosphere launched by the General Conference of UNESCO is described in this article. The program focuses on (1) the structure and functioning of the biosphere and its ecological regions, (2) the changes brought about by man on the biosphere and its resources, (3) the effects of these changes upon the human species, and (4) the education and information that must be provided on these matters.
[4 references] FTP

9.10 THE MODELING OF THE INTERACTION BETWEEN A FISHERY AND THE ECOLOGICAL SYSTEM OF A BODY OF WATER

Menshutkin, V. V. (Institute of Evolutionary Physiology and Biochemistry, U.S.S.R., Academy of Sciences)
Journal of Ichthyology [Voprosy Ikhtiologii] 11, No. 2, 158-163 (1971)

In this study, the author shows that it is possible to treat the entire ecological system of a body of water involved in fish production as a single integral system which may be mathematically modeled on a computer. The method was applied to a specific body of water (Lake Bal'neye, Kamchatka) with promising results.
[3 figures, 2 tables, 12 references] FTP

9.11 OCEANOGRAPHIC ATLAS OF THE INTERNATIONAL INDIAN OCEAN EXPEDITION

Anonymous
Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402 (1971), 531 pp., Order No. S/N 3800-0104. Price $30.00.
Selected U.S. Government Publications 1, No. 6, Item 63F (1972)

The International Indian Ocean Expedition was an intensive study of the 28 million-square-mile Indian Ocean by scientists of 28 cooperating nations working from shore stations and an extensive fleet of research vessels. Major areas of interest were biological factors, including possible fishery resources; the formation of the ocean basin and the forces that have shaped and are continuing to shape it; the chemical and physical description of the waters of the Indian Ocean, and the study of their motions; and the interaction between the ocean and the atmosphere particularly with respect to the monsoon winds. This Atlas contains 449 colored maps and diagrams. It provides information on water temperature, depth, density, temperature gradient, and transport, as well as the salt, oxygen, phosphate, nitrate, and silicate content of the water. To provide users of this Atlas with the greatest amount of information about the relatively unknown Indian Ocean, and to help provide a picture of the Ocean as an entity, the volume includes almost all data collected in the Indian Ocean from the mid-1920's to 1966.

Reprinted

9.13 UPTAKE AND RELEASE OF FREE AMINO ACIDS BY STARFISHES

Ferguson, John Carruthers (Department of Biology, Florida Presbyterian College, St. Petersburg, FL 33733)
Biological Bulletin 141, No. 1, 122-129 (Aug. 1971)

Earlier work has indicated that many species of marine invertebrates are able to remove dissolved amino acids and other nutritional compounds directly from sea water, even when the materials are present in low concentrations. In the present study, the researchers measured the net uptake and release of dissolved free amino acids by 10 species of Puget Sound starfishes. Gas-liquid chromatography was used to measure the net uptake and release of amino acids by the starfish. The author indicates that the results of this study support the concept that starfish can receive net benefit from dissolved nutrients in their environments. Furthermore, the transport system for taking up amino acids is also significant in the retention of those amino acids already in the metabolic pools.
[4 tables, 21 references] FTP

9.11 COLD, NUTRIENT-RICH WATER: THE MOST ABUNDANT RESOURCE OF THE DEEP SEA

Roels, O. A., L. Van Hemelrijck, R. D. Gerard, and J. L. Worzel (Lamont-Doherty Geological Observatory, Columbia University, Palisades, N.Y.)
In Colloque International sur l'Exploitation des Oceans, Bordeaux, France, Mar. 9-12, 1971. 22 pp. Available from the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22151. Order No. COM-72-10086.
NOAA Publications Announcement No. 72-5, Item 72-05-18-01, 8 (Feb. 1972)

After having made use of its thermal energy, cold, deep-sea water is a source of nutrients feeding a mariculture operation and producing a valuable crop of seafood. The sea water finally released, having been stripped of its nutrients in the mariculture system, is then chemically and physically similar to the surface waters and will not affect the local ecology. (Author text, mod. by RW) Reprinted

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9.12 MARINE BIOLOGY AND CHEMISTRY

Lange, Rolf (Inst. Mar. Biol., Univ. Oslo, Oslo, Norway)
Chemical Abstracts 76, No. 8, 37142t (Feb. 21, 1972)

9.11 SYSTEM FOR LOWERING A SUBSEA DEVICE FROM A VESSEL

Howard, George C. (Tulsa, Okla.); assignor to Pan American Petroleum Corp., Tulsa, Okla. (pat.)
U.S. Patent 3,641,961
Official Gazette of the U.S. Patent Office 895, No. 3, 878 (Feb. 15, 1972)
This is a system for lowering a subsea device from a floating vessel. FTP

9.13 ISOLATION OF INFECTIOUS PANCREATIC NECROSIS VIRUS FROM WHITE SUCKERS (CATASTOMUS COMMERSONI)

Sonstegard, R. A., and L. A. McDermott (Department of Microbiology, College of Biological Science, University of Guelph, Guelph, Ontario, Canada), Karen S. Sonstegard (Department of Biomedical Sciences, Ontario Veterinary College, University of Guelph)
Nature 236, No. 5343, 174-175 (Mar. 24, 1972)

This paper is the first report of the isolation of infectious pancreatic necrosis (IPN) virus from nonsalmonid fishes. IPN is an acute, highly contagious disease of salmonid fishes characterized by explosive outbreaks of mortalities in salmonid fry. Little is known concerning the occurrence and consequences of the disease in native fishes. Therefore, the authors conducted a survey to determine the presence of IPN virus in fishes in the tailwaters of two IPN-infected trout hatcheries.

The researchers found the visceral homogenate from the suckers to possess an IPN titre of $10^{3.1}$ TCID50; however, this observation does not prove necessarily that these fish were actively infected with the virus. The virus detected may have been that ingested in infected food. White suckers (and perhaps other nonsalmonid fishes) may play a role in the ecology and epizoology of infectious pancreatic necrosis. [1 table, 6 references] FTP

9.11 A TECHNIQUE FOR BIOASSAY OF FRESHWATER, WITH SPECIAL REFERENCE TO ALGAL ECOLOGY

Lund, John W., George H. M. Jaworski (Freshwater Biological Association, Windermere Laboratory, Ambleside, Westmoreland, England), and Halina Bucka (Zakład Biologii Wód, Polska Akademia Nauk, Kraków, ul. Slawkowska 17, Poland)
Acta Hydrobiologica 13, No. 3, 235-249 (1971) (Laboratory of Water Biology, Polish Academy of Sciences, Kraków, Poland)

The authors describe a technique for bioassay of fresh water that can be applied in the determination of the potential fertility of waters.
[3 figures, 2 references] FTP

9.11 MOORING DEVICES

Bullen, Leslie Gerald (Dartmouth, Nova Scotia, Canada); assignor to EMI Limited, Hayes, Middlesex, England) (pat.)
U.S. Patent 3,631,550
Official Gazette of the U.S. Patent Office 894, No. 1, 73 (Jan. 4, 1972)
This mooring device has a float to be held at a given depth. FTP

8.50 TENTATIVE RULES FOR THE NOMENCLATURE OF CAROTENOIDS

Anonymous
European Journal of Biochemistry 25, No. 3, 397-408 (Feb. 1972)

These rules are issued by the IUPAC Commission on the Nomenclature of Organic Chemistry (CNOC) and the IUPAC-IUB Commission on Biochemical Nomenclature (CBN). FTP

9.11 (8.4)

data are presented, and they are followed by an outline of computer requirements and program limitations.

The STD provided many detailed profiles along cruise tracks in the eastern tropical Pacific with an accuracy approaching those taken by Nansen casts; but it created new problems in processing oceanographic data. The problems, their solutions and recommendations are presented for those who may benefit from many months of processing STD data from EASTROPAC cruises.
[7 figures, 6 references; 1 appendix with 3 figures] Authors' abstract

9.13 SEASONAL VARIATIONS IN THE METABOLISM OF LIPIDS AND GLYCOGEN IN THE SCALLOP, PATINOPECTEN YESSOENSIS (Jay).

Takahashi, Kanji, and Katsuyoshi Mori (Department of Fisheries, Faculty of Agriculture, Tohoku University, Sendai, Japan)
Tohoku Journal of Agricultural Research 22, No. 2, 114 ff. (Aug. 1971)

I. Biochemical Studies. pp. 114-133.

The purpose of this study was to examine biochemically the seasonal variations in the metabolism of lipids and glycogen in cultured scallops. The digestive diverticula of the scallop contained high levels of lipids; the adductor muscle contained high levels of glycogen. The seasonal variations in the level of lipids in the digestive diverticula and the level of glycogen in the adductor muscle were generally parallel to the variations of the same constituents in the entire soft body of the scallop. The authors suggest from these observations that the digestive diverticula in the scallop is the main organ for lipid metabolism and the adductor muscle is the main organ for glycogen metabolism.
[8 figures, 4 plates containing 4 illustrations each, 11 references]

II. Histochemical studies. pp. 134-145.

The purpose of this work was to examine histochemically the seasonal variations in the metabolism of lipids and glycogen in cultured scallops. The lipids in the digestive diverticula appeared as numerous droplets in the epithelia of the tubules (they were also present in the epithelia of the ducts). The glycogen in
(over)

9.13 (8.59) THE CONTENT OF FAT-FREE DRY MATTER IN THE BODY OF SOME BLACK SEA FISHES

Shul'man, G. Ye., and L. M. Kokoz (Institute of the Biology of the Southern Seas, Ukrainian Academy of Sciences, Sevestopol' and Azov-Black Sea Research Institute for Fisheries and Oceanography, Kerch, U.S.S.R.)
Journal of Ichthyology 11, No. 2, 268-272 (1971)

The content of fat-free dry matter in the body of the anchovy, sprat, whiting, surmullet, bonnetmouth, large horsemackerel, and small horsemackerel is extremely stable and varies very little with age of the fish or with different periods of the annual cycle. Furthermore, no relation exists between the content of fat-free dry matter in the body of the fishes and aspects of their metabolism or mode of life. The results indicate that the protein content of the fish body is extremely stable, reflecting the maintenance of the relative mass of structural elements in the fishes at a level that is approximately constant for a given species.
[8 figures, 3 tables, 25 references] FTP

9.13 (9.19) COMPARATIVE METABOLISM OF DDT, METHYLCHLOR, AND ETHOXYCHLOR IN MOUSE, INSECTS, AND IN A MODEL ECOSYSTEM

Kapoor, Inder P., Robert L. Metcalf, Asha S. Hirwe, Po-Yung Lu, Joel R. Coats, and Robert F. Nystrom (Departments of Entomology and of Zoology, University of Illinois, Urbana, IL 61801)
Journal of Agricultural and Food Chemistry 20, No. 1, 1-6 (January-February 1972)

This article reports information on the metabolism of DDT [1,1,1-trichloro-2,2-bis(p-chlorophenyl)-ethane], methylchlor [2,2-bis(p-methylphenyl)-1,1,1-trichloroethane], and ethoxychlor [2,2-bis(p-ethoxyphenyl)-1,1,1-trichloroethane]. The metabolic pathways of methylchlor and ethoxychlor in mice and insects and for biodegradability in a model ecosystem were examined.

Ethoxychlor [like methoxychlor] is metabolized by O dealkylation to form 2-(p-hydroxyphenyl)-2-(p-ethoxyphenyl)-1,1,1-trichloroethane and subsequently to 2,2-bis(p-hydroxyphenyl)-1,1,1-trichloroethane. In the model ecosystem, ethoxychlor appeared in fish (top of the food chain) at 1,500 times the amount it appeared in water, together with larger amounts of polar and dealkylation products.

Metabolization of methylchlor was by oxidation of its arylmethyl groups to form 2-(p-hydroxymethylphenyl)-2-(p-methylphenyl)-1,1,1-trichloroethane and by subsequent oxidation to 2,2-bis(p-carboxyphenyl)-1,1,1-trichloroethane. In the model ecosystem, fish contained 1,400 times the amount of methylchlor that was in the water, together with larger amounts of polar metabolites.

Ethoxychlor and methylchlor (DDT analogs) are much more biodegradable than DDT is; DDT was concentrated in fish at 85,000 times the amount in water.
[5 figures, 7 tables, 14 references] FTP

9.13 (0.35) PHOSPHOLIPIDS OF FISH GILLS

Thomas, Andrew J., and Stuart Patton (Lipids Laboratory, The Pennsylvania State University, University Park, PA 16802)
Lipids 7, No. 1, 76-78 (Jan. 1972)

Lipids were extracted from nine species of fish and the individual phospholipids as a percentage of the total were determined. The fish tested were coho salmon, pink salmon, kelp bass, sand bass, whitefish, sheepshead, Pacific rattail, and flatnose codling. The pattern of composition of the phospholipids in the gill filaments of the fish did not appear to vary among the fish living at greatly differing ocean depths; also, the pattern did not appear to vary between pre- and postspawning salmon. [1 table, 11 references] FTP

9.13 FATTY ACID ALTERATIONS DURING MIGRATION AND EARLY SEA WATER GROWTH OF CHUM SALMON (ONCORHYNCHUS KETA)

Saddler, J. B., K. V. Koski, and R. D. Cardwell (Fisheries Research Institute, University of Washington, Seattle, WA 98195)
Lipids 7, No. 2, 90-95 (Feb. 1972)

This study was conducted in May and June of 1968. The purpose was to examine the fatty acid characteristics and lipid contents of chum salmon fry during their early development in fresh water, seaward migration, and early sea-water growth. Some data on lipid contents are shown in the table that follows.

Group of fry1/	Fork length (mean)	Body weight (mean)	Lipid content
	mm.	g.	%
FW	37	0.31	2.5
SW	38	0.44	2.4
FW→SW	38	0.29	2.0
FW	44	0.54	1.7
SW	45	0.84	2.0
FW→SW	45	0.47	1.4
SW	52	1.40	1.7
FW→SW	55	0.99	1.4

1/ FW - residing in fresh water; SW - after migration into sea water; FW-SW - following artificial introduction into sea water.

Extensive residence (2-3 weeks) of the fry in fresh water resulted in a fatty acid pattern in the fish more characteristic of fresh-water fish; residence of fry in sea water resulted in fatty acid patterns characteristic of marine fish. The fry introduced artificially into sea water incurred substantial diminutions in their content of polyunsaturated fatty acids.
[4 tables, 29 references] FTP

9.16 REHABILITATION OF NATURAL OYSTER SEED GROUNDS DESTROYED OR DAMAGED BY HURRICANE CAMILLE

Tarver, Johnnie
Completion Report, Project 2-101-D, 8 pp. (Jan. 1971) Louisiana Wild Life and Fisheries Commission, New Orleans, La. Available from the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22151. Order No. COM-72-10059.
NOAA Publications Announcement No. 72-5, Item 72-05-16-15, 7 (Feb. 1972)

Large Rangia clam shell 3/4 in. in diameter or larger dredged in Lake Maurepas was planted in October and November of 1969 to provide oyster cultch for use in September 1971 and in subsequent years. Clam shells were washed overboard using six high-pressure water hoses powered by two diesel pumps with about 90 psi pressure on a 1.25 in. nozzle. A total of 1,218 superficial acres were planted with 30,083 cubic yards of clam shell in 35 days at a cost of $119,430.90. Periodically, clam shells were dredged and oyster spat were counted, measured, and recorded. Oyster spat catch at the Black Bay site was 22 percent; whereas, the catch was 10 percent at Three Mile Pass. Initial examinations of the shell indicate that this shell planting effort was successful. (Author abstract, mod. by SK)
Reprinted

9.13

the adductor muscle was localized in the cells of the connective tissue. The level of lipids (mostly neutral fats) in the epithelia of the tubes of the digestive diverticula was high in the summer, but decreased markedly when the scallops began the development of sexual maturity. However, the total amount of lipids increased rapidly during sexual maturation. Also, the glycogen content of the adductor muscle increased during the process of sexual maturation of the scallop.
[2 tables, 2 plates containing a total of 13 illustrations, 10 references] FTP

9.14 A STUDY OF THE DIGESTIBILITY OF ARTIFICIAL FOODS BY POND FISHES. COMMUNICATION IV. DIGESTIBILITY OF THE NUTRIENTS OF SUNFLOWER OIL-SEED MEAL, LUPIN, RYE AND FOOD MIXTURE BY YEARLING CARP

Shcherbina, M. A., and O. P. Kazlauskene (All-Union Pond Fisheries Research Institute, Rybnoye Postal District, Moscow Province, U.S.S.R.)
Journal of Ichthyology 11, No. 2, 253-257 (1971)

This paper reports on feeding tests carried out in 1968 on yearling carp reared in ponds. The test was conducted for 70 days. The components of the carp diets tested consisted of sunflower oil-seed meal, lupin, rye, and a food mixture consisting of 40% sunflower oil-seed meal, 10% linseed cake, 12% lupin, 26% rye, 5% fishmeal, 4% hydrolysate yeast, and 3% grass meal.

Apparently, the digestibility of the sum total of all the nutrients of the foods tested ranged from 40% to 52%. The diet supplied insufficient energy (the lipid content was low and the digestibilities were low). As a result the carp had to utilize the protein of the diet for energy metabolism. More attention must be placed on the energy content of the diets for carp.
[4 tables, 9 references] FTP

9.13 ACCUMULATION OF FREE FATTY ACIDS FROM SEA WATER BY MARINE INVERTEBRATES

Testerman, John K. (Department of Development and Cell Biology, University of California, Irvine CA 92664)
Biological Bulletin 142, No. 1, 160-177 (Feb. 1972)

The researchers established that representative marine annelids can accumulate and metabolize dissolved free fatty acids. They confirmed the uptake of free fatty acid from dilute solution by the polychaete Stauronereis rudolphi. Apparently, the levels of free fatty acids found in the natural environment are probably too low for uptake to support more than a few percent of the organism's metabolism. [5 figures, 5 tables, 32 references] FTP

9.16 AQUACULTURALLY GROWN PAN-SIZE SALMON COULD SOLVE FISH SCARCITY PROBLEM

Katz, Arnie
Quick Frozen Foods 34, No. 8, 81-83, 109 (Mar. 1972)

Salmon are being reared to ½-lb. size in Puget Sound using floating-net pens. The first harvest is expected to total 200,000 lb. of fish. [3 illustrations] FTP

9.16 STUDIES ON THE USE OF VERTICAL SUBSTRATES FOR IMPROVING PRODUCTION OF PINK SHRIMP, PENAEUS DUORARUM BURKENROAD

Rickards, William L. (University of Miami, Sea Grant Program (Living Resources), Miami, Fla.)
Sea Grant Technical Bulletin No. 10, 152 pp. (Jan. 1971) Sales copies available from the National Technical Information Service, Sills Bldg., Springfield, VA 22151; Order No. COM-71-01064.
NOAA Publications Announcement No. 72-1, (72-01-16-20), 8 (Jan. 1972)

Three experiments were conducted to determine the manner in which pink shrimp react to one artificial condition: the presence of manmade, vertical surfaces upon which the shrimp are intended to move and feed. The results of the studies show that it is possible to realize significantly greater yields from shrimp grown in tanks in which an assemblage of fouling organisms is available as food than from shrimp with no fouling food source, even though all shrimp are given some supplemental protein. Although a certain amount of fouling will grow on the bottoms of shrimp ponds without encouragement by the culturist, in many instances the algae will be mainly blue-green species. (Author) Reprinted

9.19 MERCURY CONCENTRATIONS IN MUSEUM SPECIMENS OF TUNA AND SWORDFISH

Miller, G. E., P. M. Grant, R. Kishore, F. J. Steinkruger, F. S. Rowland, and V. P. Guinn (Department of Chemistry, University of California, Irvine, CA 92664)
Science 175, No. 4026, 1121-1122 (Mar. 10, 1972)

Have manmade sources of mercury pollution of the oceans significantly increased the mercury levels in wide-ranging ocean fish? To help answer this question the present researchers determined by instrumental neutron activation analysis the mercury levels of museum specimens of 7 tunas caught 62 to 93 years ago and a swordfish caught 25 years ago. Data on the mercury levels of the museum specimens were compared with that of specimens caught recently.

The mean mercury concentration of the seven museum specimens of tuna was 0.95±0.33 p.p.m. (the values ranged from 0.53 to 1.51 p.p.m.) (dry-weight basis). The mean mercury content of the five recent samples of tuna was 0.91±0.47 p.p.m. (the values range from 0.44 to 1.53 p.p.m.). The authors conclude that there was no significant difference in mercury concentration between the museum samples of tuna (caught 62 to 93 years ago) and the samples of recently caught tuna. Furthermore, they indicate that the data for tuna and swordfish support the contention that the mercury levels now being found in wide-ranging ocean fish are not primarily the result of manmade pollution but are of natural origin.
[1 table, 5 references] FTP

9.17 (9.2) ENVIRONMENT CONFERENCE DOCUMENTS TO BE PUBLISHED FOR PUBLIC SALE

Anonymous
Department of State Bulletin 66, No. 1709, 494 (Mar. 27, 1972)

The Department of State has arranged for publication of the documentation prepared by the Secretariat of the United Nations Conference on the Human Environment for consideration by the nations attending the meeting which is to be held in Stockholm, Sweden, June 5-16. The documents total 632 pages and will be reproduced by the National Technical Information Service (NTIS) of the Department of Commerce. A complete set may be purchased for $12 or three parts individually. The part numbers, the number of pages of each section, and the NTIS order number, together with the price, are listed below.

Part I includes Agenda (4 pp.), Annotated Agenda (12), Rules of Procedure (14), Declaration (12), Action Proposals (60). (Order no. PB 206618-1; $3.)

Part II includes Planning & Management of Human Settlements for Environmental Quality (40), Environmental Aspects of Natural Resources Management (100), Identification & Control of Pollutants & Nuisances of Broad International Significance (100), Educational, Informational, Social & Cultural Aspects of Environmental Issues (40), Development & Environment (70), International Organizational Implications of Action Proposals (50). (Order no. PB 206618-2; $6.)

Part III includes Administration Coordinating Committee Report (80), Bibliography (50). (Order no. 206618-3; $3.)

Complete set of above. (Order no. 206618-SET; $12.)

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9.19 RELEASE OF MERCURY FROM CONTAMINATED FRESHWATER SEDIMENTS BY THE RUNOFF OF ROAD DEICING SALT

Feick, G., R. A. Horne, and D. Yeaple (JBF Scientific Corporation, 2 Ray Avenue, Burlington, MA 01803)
Science 175, No. 2046, 1142-1143 (Mar. 10, 1972)

The mercury content in stream sediments varies widely with the type of sediment [Y. G. Bayev, Dokl. Akad. Nauk SSSR 181, 211 (1968)]. It is known that chloride ion complexes strongly with mercury, and sodium and calcium ions can compete with Hg^{2+} for exchange sites. The authors found that the addition of NaCl or $CaCl_2$ increased the relative amount of mercury in water in equilibrium with sediments (sandy, or highly organic) by two to five or more orders of magnitude. The possibility is raised, therefore, that road salt (in addition to being a serious contaminant itself) could release mercury from bottom sediments of natural water courses. This information, too, is of interest relative to the chemistry of heavy metals in the estuarine environment where sediment-laden fresh water and salt water are mixed. [1 table, 4 references] FTP

9.19 BIOLOGIC EFFECTS OF LEAD IN FISH

Aronson, Arthur L. (New York State Vet. Coll., Cornell Univ., Ithaca, N.Y.)
Chemical Abstracts 76, No. 1, 634d (Jan. 3, 1972)

9.17 (9.2)

The action proposals included in part I are a summary of the issues and include as an appendix all recommendations for national and international action. Thus part I should meet the requirements of most of the public interested in the Stockholm meeting. Orders should be addressed to the National Technical Information Service, Department of Commerce. Springfield, VA, 22151, accompanied by check or money order made payable to NTIS. It is essential that the NTIS document number be indicated on the order for prompt service. Reprinted

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9.16 FERTILIZER EXPERIMENTS IN CHUPEI FRESHWATER PONDS--I. THE EFFECT OF PHOSPHORUS FERTILIZER AND MIXED N-P-K ON PLANKTON AND FISH PRODUCTION

Ong, Hong-Siong (Freshwater Fisheries Laboratory, Sembawang Field-Experimental Station, 10½ M.S. Sembawang Road, Singapore 26)
Aquiculture 1, No. 4, 14-22 (Dec. 1971) (In Chinese; abstract, figures, and tables in English)

The purpose of this study was to determine whether phosphate alone or a mixed fertilizer of N-P-K is more effective in increasing plankton and fish production. The phosphate fertilizer alone proved to be more effective in the production of fish than did the mixed fertilizer. The mean fish production was as follows: for control ponds, 382 kg/ha; for the phosphate fertilizer-treated ponds, 824 kg/ha; and for the N-P-K fertilizer-treated ponds, 581 kg/ha.
[5 figures, 3 tables, 11 references] FTP

9.19 METHYL MERCURY ACETATE REMOVAL FROM WATERS BY CHROMATOGRAPHY ON CHELATING POLYMERS

Muzzarelli, Riccardo A. A., and Antonio Isolati (G. Ciamician, Chemical Institute, University of Bologna, Via Selmi 2, Bologna 40126, Italy)
Water, Soil, and Air Pollution 1, No. 1, 65-71 (Nov. 1971)

Results of experiments using column chromatography showed that chitosan and Dowex A 1 (Chelex) are effective in collecting Hg, even though the metalorganic compounds are not fixed so strongly as the simple ions. The authors suggest that these chelating polymers might be applied in the treatment of those waters where monomethyl mercury and mercury ions are present.
[1 figure, 2 tables, 26 references] FTP

9.16 PROGRESS IN POMPANO MARICULTURE IN THE UNITED STATES
(1.19)

Finucane, John H. (NOAA, National Marine Fisheries Service, Biological Laboratory, St. Petersburg Beach, Fla.)
In World Mariculture Society, First Annual Workshop, Louisiana State University, Baton Rouge, La., Feb. 9-10, 1970. Proceedings, Baton Rouge, La., pp. 69-72 (1971)
NOAA Publications Announcement No. 71-20 (71-20-16-13), 6 (Dec. 1971)

Pompano (Trachinotus carolinus) mariculture has accelerated in Florida and other areas along the Gulf Coast. Research by numerous governmental, academic, and commercial organizations should ensure success in the future. Present regulatory laws in Florida now require leasing of bay bottoms for mariculture purposes and limit the stocking of any commercial numbers of wild pompano. Pompano are hardy, fast-growing fish, and command a high price. Experimental results show that it is possible to produce a market-size fish in about 6 months. With a balanced diet, temperature control, and good water quality, production exceeding 5,600 kg per ha may be possible. Because of their prolific egg production, only a few adult fish would be needed to provide brood stock for a hatchery operation. Mature fish can be spawned artifically using hormones such as chorionic gonadotrophin, although a complete hatching process has not yet been successful. The major problems such as availability of juveniles, stabilized water temperature, an efficient commercial diet, and control of fish diseases can eventually be solved with sound research. With increasing demand for quality seafood, the economic future for pompano mariculture appears to be excellent. The high market value ensures commercial success once large-scale production of this fish is achieved. (Author) Reprinted

9.19 SPECIES DIVERSITY AND WATER QUALITY IN GALVESTON BAY, TEXAS

Copeland, B. J., and Timothy J. Bechtel (Department of Zoology, North Carolina University, Raleigh, NC 27607, U.S.A.)
Water, Air, and Soil Pollution 1, No. 1, 89-105 (Nov. 1971) (D. Reidel Publishing Co., Dordrecht, Netherlands)

This work demonstrates that species diversity (phytoplankton, zooplankton, nekton, and benthos samples) levels in Galveston Bay, Texas, are related to the percentage of unpolluted water at any given station in upper and lower Galveston Bay. [5 figures, 6 tables, 19 references] FTP

9.19 OIL POLLUTION BY SHIPS AND FREEDOM OF THE HIGH SEAS
(9.3)

Dinstein, Yoram (Tel Aviv University, Tel Aviv, Israel)
Journal of Maritime Law and Commerce 3, No. 2, 363-374 (Jan. 1972)

This article is a discussion of the various methods that have been evolved of coping with the problem of oil pollution of the high seas and the distinction not only between legal techniques but also between legal concepts. The author concludes that the legal solution that could best reconcile the need for controlling oil pollution with the principle of the freedom of the high seas would necessitate a new international convention. He lists five main points upon which such a convention would be based. [54 footnotes] FTP

9.19 LEGAL REMEDIES FOR POLLUTION ABATEMENT
(9.3)

Levi, Donald R. (University of Missouri, Columbia, MO 65201), and Dale Colyer (Division of Resource Management, West Virginia University, Morgantown, WV 26506)
Science 175, No. 4026, 1085-1087 (Mar. 10, 1972)

The author believes that citizen-initiated legal approaches may help to protect and improve the environment (for the sake of discussion the authors accept that an ecological crisis exists). Such an approach may have two important results: (1) actual or potential cases of pollution may be halted, reduced, or prevented and (2) the problems and insecurities following a substantial body of litigation may lead to the more comprehensive and rational planning and development that is required for solutions to the ecological crisis.
[36 references and footnotes] FTP

9.19 APPEARANCE OF 1-HYDROXYCHLORDENE IN SOILS, CROPS, AND FISH

Bonderman, Dean Paul, and Edwin Slach (Department of Clinical Pathology, Indiana University Medical Center, Indianapolis, IN 46202)
Journal of Agricultural and Food Chemistry 20, No. 2, 328-331 (Mar.-Apr. 1972)

Heptachlor was one of the earliest and most important organochlorine insecticides to have widespread use on agricultural lands. It has a wide variety of metabolic end products, e.g. heptachlor epoxide, chlordene, chlordene epoxide, 1-hydroxychlordene, and 1-hydroxy-2,3-epoxychlordene are products of microorganism degradation of heptachlor [J. R. W. Miles, C. M. Tu, C. R. Harris, J. Econ. Entomol. 62, No. 6, 1334 (1969)]. γ-Chlordane is the principle impurity in the stored material [M. C. Bowman, H. C. Young, and W. F. Barthel, J. Econ. Entomol. 58, No. 5, 896 (1965)]. The monitoring of heptachlor and its epoxide in the environment or in humans may not, therefore, give an adequate indication of its ultimate impact. Orderly analyses, using appropriate detection and conformatory techniques, should be done on each particular metabolite to establish a library of information upon which rational judgments can be made about their effect on human health and the environment. This article is a report of the orderly study of the metabolite 1-hydroxychlordene. It includes an estimation of the pesticide use by the farm (where the metabolite of heptachlor occurred) and the analyses of environmental samples taken from the same geographical area. Fifteen hundred soils, 400 crops, and 75 fish samples were examined; 12 soils, 12 crops, and 13 fish samples were positive for 1-hydroxychlordene. The authors indicated that the finding of 1-hydroxychlordene in fish taken from the river and lakes fed by the runoff from

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9.19 MERCURY INHIBITION ON LIPID BIOSYNTHESIS IN FRESHWATER ALGAE

Matson, Robert S., George E. Mustoe, and S. B. Chang (Department of Chemistry and College of Environmental Science, Western Washington State College, Bellingham, WA 98225)
Environmental Science & Technology 6, No. 2, 158-160 (February 1972)

The purpose of this study was to determine the biological effect of mercury compounds on unicellular algae (one of the important members in the aquatic food chain). This paper reports on the in vivo effect of mercuric chloride and methyl mercuric chloride on fresh-water algae, Ankistrodesmus braunii and Euglena gracilis under laboratory conditions, and on the effects of these mercury compounds on an enzyme, galactosyl transferase (responsible for the biosynthesis of galactolipids, one of the major chloroplast lipids).

Mercuric chloride and methyl mercuric chloride strongly inhibit the synthesis of galactolipids and chlorophylls in whole cells of the unicellular algae under photosynthetic conditions. These mercury compounds also strongly inhibit the galactosyl transferase activity for the galactolipid biosynthesis in the chloroplasts isolated from Euglena cells and spinach leaves. Thus, the authors suggest, a similar detrimental effect could be expected with other photosynthetic organisms including phytoplanktons and other species of unicellular algae.
[2 figures, 2 tables, 12 references] FTP

9.19 EFFECT OF MERCURY ON ALGAL GROWTH RATES

Hannan, Patrick J., and Constance Patouillet (U.S. Naval Research Laboratory, Washington, DC 20390)
Biotechnology and Bioengineering 14, No. 1, 93-101 (Jan. 1972)

This paper reports on the effects of various concentrations of mercury and other pollutants (silver, cadmium, lead, and copper) on the growth rates of various algae under controlled conditions in the laboratory. The tests were conducted on one fresh-water alga (Chlorella pyrenoidosa) and three marine algae (Phaeodactylum tricornutum, Cyclotella nana, and Chaetoceros galvestonensis). Mercury was more toxic than the other metals tested and its toxicity is comparatively irreversible. Also, the toxicity of mercury varied inversely with the level of nutrients present. Results of preliminary tests indicate that mercury in the form of mercuric chloride is more toxic than is methylmercury. The authors have yet to determine the amount of mercury that the algae can absorb and still grow. The subsequent phase of this study will include measurements of growth, oxygen production, and mercury uptake of algae.
[3 figures, 1 table, 12 references] FTP

9.19 (9.2) PRIVATE COMPENSATION FOR INJURIES SUSTAINED BY THE DISCHARGE OF OIL FROM VESSELS ON THE NAVIGABLE WATERS OF THE UNITED STATES

Post, Thomas R.
Sea Grant Technical Bulletin No. 22, University of Miami Sea Grant Program (Ocean Law) NOAA Sea Grant No. 2-35147, Coral Gables, Fla. (1971), vi + 72 pp. Price $3.00. Available from Information Services, Sea Grant Institutional Program, University of Miami, 10 Rickenbacker Causeway, Miami, FL 33149.

In this study, the author examined matters relative to compensation to private persons for damage sustained by the discharge of oil from vessels on the navigable waters of the United States.
[206 footnotes, 1 table, bibliography of 73 references to articles, books, cases, treaties, and other documents] FTP

9.19 (9.17)(9.2) ENVIRONMENT, RESOURCES, POLLUTION AND SOCIETY

Murdoch, William W. (editor), Sinauer Assoc., Stamford, Conn. (1971), vii + 440 pp. Price $5.95
D. W. Chapman (Idaho Cooperative Fishery Unit, University of Idaho, Moscow, ID 83843) (reviewer)
Transactions of the American Fisheries Society 101, No. 1, 137-138 (January 1972)

The book is divided into three general subject areas: population and resources; environmental degradation; and environment and society. FTP

9.19 (0.5) THERMAL EFFECTS ON THE CONNECTICUT RIVER: BACTERIOLOGY

Buck, John D., and Julia S. Rankin (Marine Research Laboratory, University of Connecticut, Noank, CT 06340)
Journal of the Water Pollution Control Federation 44, No. 1, 47-64 (Jan. 1972)

The objective of this study was to develop information relating to the effects of discharges from an atomic power plant on the aquatic environment to permit a rational evaluation of the disposal process. The aquatic environment near the site of an atomic power plant on the Connecticut River was selected as the site of this test. Before the power plant began operations, the researchers obtained data on the baseline populations of bacteria, phytoplankton, and chemical conditions of the particular area of the river; these data were used to compare with similar observations that were made after the plant began the generation of power. The study period extended from October 1965 to September 1969; it included 27 months before the plant began operations and 21 months after operations were initiated. Counts of mesophilic (30° C.), psychrophilic (5° C.), and thermophilic (45° and 55° C.) bacteria in the water were made. Also, the following types of bacteria were enumerated: proteolytic, amylolytic, lipolytic, anaerobes, acid and base producers, "marine" forms, total and fecal coliforms, and fecal streptococci (enterococci).

The researchers found no quantitative differences in any groups of bacteria studied. However, they consider the observational period following plant operations to be relatively short. Under the limitations of the test, therefore, they conclude that there were no drastic changes in the overall microbial ecology of the river as a direct result of the addition of thermal effluent.
[13 figures, 4 tables, 34 references] FTP

9.19 (9.3) OCEAN POLLUTION AND THE 1972 UNITED NATIONS CONFERENCE ON THE ENVIRONMENT

Mendelsohn, Allan I. (Glassie, Pewett, Beebe & Shanks, Washington, D.C.)
Journal of Maritime Law and Commerce 3, No. 2, 385-398 (Jan. 1972)

The United Nations Conference on Human Environment is scheduled to meet in Stockholm, Sweden, in June 1972. At a meeting of the Intergovernmental Working Group on Marine Pollution (London, June 14-18, 1971), the United States Government tabled a draft convention on ocean dumping for consideration and comment by all interested nations. Following the meeting, the U.S. Government, through the Secretary of State's Advisory Committee on the Stockholm Conference, held various public conferences in the United States to solicit public views on the conference and draft treaty. The present article, reports the author's views as expressed before the Advisory Committee on July 27, 1971. The author believes that the draft treaty is inadequate substantially as well as strategically. FTP

9.19 (8.42) MERCURY IN WATER. A BIBLIOGRAPHY

Anonymous
Water Resources Scientific Information Center, Office of Water Resources Research, U.S. Department of the Interior, Washington, D.C. (Jan. 1972), 294 pp. Available from the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22151. Order No. WRSIC72-207. Price $3.00, paper copy; $0.95 in microfiche.

9.19 (9.3) PESTICIDES AND THE ENVIRONMENT

Anonymous
Administrative Law Review 24, No. 1, 121-135 (Winter 1972)

This report directs itself to consideration of the federal regulations surrounding pesticides, those agencies that play a part in that regulation, the administrative procedures involved, and the means of administrative and judicial review under regulatory system.
[102 footnotes; the Selected Bibliography lists 7 books, 9 Federal Regulations, 14 reports, 15 articles] FTP

9.19 (0.8) ANALYSIS OF DECOMPOSITION PRODUCTS OF PESTICIDES

Kennedy, Maurice V., Boris J. Stojanovic, and Fred L. Shuman, Jr. (Mississippi State University, State College, MS 39762)
Journal of Agricultural and Food Chemistry 20, No. 2, 341-343 (Mar.-Apr. 1972)

One of the major problems of today is the disposal of waste pesticides and pesticides containers without contaminating the environment. This paper reports the results of analyses to identify the products formed from the thermal or chemical decomposition of 20 selected pesticides.

The thermal decomposition products were carbon dioxide, carbon monoxide, nitrogen oxides, hydrochloric acid, and residues of inorganic compounds. The decomposition products formed when the pesticides were exposed to chemicals varied with the chemical used.
[3 tables, 6 references] FTP

9.19

the test agricultural area was interesting because it appears to be the first reported case of the metabolite being found in vertebrate tissue. The 1-hydroxychlordene was found in samples of buffalo, sunfish/crappy, blue gill, catfish, and carp. [5 tables, 14 references] FTP

9.19 ETHYL MERCURY p-TOLUENE SULFONANILIDE: LETHAL AND REPRODUCTIVE EFFECTS ON PHEASANTS

Spann, J. W., R. G. Heath, J. F. Kreitzer, and L. N. Locke (Patuxent Wildlife Research Center, Bureau of Sports Fisheries and Wildlife, U.S. Department of the Interior, Laurel, MD 20810)
Science 175, No. 4019, 328-331 (January 21, 1972)

Ethyl mercury p-toluene sulfonanilide (the active ingredient of the commercial fungicide Ceresan M) at a dietary concentration of 30 p.p.m. (12.5 p.p.m. of Hg) was lethal to adult ring-necked pheasants. Also, the authors found that egg production and survival of third-week embryos were sharply reduced when breeders were maintained on feed containing 10 p.p.m. of mercury p-toluene sulfonanilide per million (4.2 p.p.m. of Hg).
[2 tables, 10 references] FTP

9.19 (9.17)(9.2) THE EFFECTS OF WATER- AND LAND-USE DEVELOPMENT ON THE AQUATIC ENVIRONMENT AND ITS RESOURCES AND SOLUTIONS TO SOME OF THE GENERATED PROBLEMS

Dill, William A., and D. W. Kelly (FAO Department of Fisheries), and J. C. Fraser (Environment Protection Authority, Victoria, Australia)
FAO Fisheries Circular No. 129, FIRI/C129, 7 pp. (August 1971) (Distribution re-restricted) (Food and Agriculture Organization of the United Nations, Via delle Terme di Carcalla, Rome, Italy)

Because water resource and land development projects modify hydrological cycles and existing patterns of water and land use, they may have negative effects on the aquatic environment and the living resources. Some of these negative effects may be offset, entirely or in part, if (1) a review of the possible problems is made early in the planning stage of the project, (2) the problems are recognized, (3) the problems are investigated in the field, (4) the recommendations are prepared and submitted before completion of the project plans, and (5) the recommendations are implemented concurrently and in a timely manner relative to development of the water resource and land development project. Furthermore, there should be post-project review to assess the application and value of the recommendations. The report contains one table that lists a variety of water- and land-use activities, their effects on aquatic resources, and some possible solutions to the problems created. [7 references] FTP

9.19 DEVELOPMENT OF BIODEGRADABLE ANALOGUES OF DDT

Metcalf, Robert L., Inder P. Kapoor, and Asha S. Hirwe
Chemical Technology 2, No. 2, 105-109 (Feb. 1972) (American Chemical Society, 1155 Sixteenth Street, Washington, DC 20036)

Persistent, biodegradable insecticides should be developed that would be of the same order of durability as DDT on foliage, animal bodies, and interiors of habitations, but when taken into the bodies of living organisms will be rapidly degraded biochemically and excreted. In this article, the authors demonstrated that biodegradability can be imparted to such persistent compounds as DDT by adding specifically designed handles to the basic molecule that permit it to become a substrate for the multifunction oxidase enzymes. These enzymes, they state, convert lipid partitioning substrates into more water-soluble molecules that are excreted from animal bodies rather than being stored in fatty tissues and concentrated through ecological magnification.
[2 figures, 4 tables, 17 references] FTP

9.19 WATER POLLUTION IN LAKE MICHIGAN BY TRACE ELEMENTS FROM POLLUTION AEROSOL FALLOUT

Winchester, John W., and Gordon D. Nifong (University of Michigan, Ann Arbor, MI 48104, U.S.A.)
Water, Air, and Soil Pollution 1, No. 1, 50-64 (Nov. 1971)

This paper presents a partial inventory of air pollution emissions for 30 trace elements for the Chicago, Milwaukee, and northwest Indiana metropolitan areas (based on published information). The authors suggest that certain trace elements which are strongly associated with air pollution sources in the Lake Michigan basin may be contributing significantly to lake water pollution by an atmospheric fallout route. The evidence presented in this report indicates that the atmosphere may now be a major source of Zn in Lake Michigan, and that atmospheric inputs of Cu and Ni may also be considerable.
[1 figure, 10 tables, 25 references] FTP

9.2 THE UNITED STATES IN A CHANGING WORLD ECONOMY

Peterson, Peter G.
Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402 (1971), 249 pp. Order No. S/N 4000-0271. Price $3.25 per set.
Selected U.S. Government Publications 1, No. 6, Item 64F (1972)

This publication consists of two volumes. Volume I, "A Foreign Economics Perspective" is a personal overview of the origins and possible policy implications of the new world economy, as seen by Mr. Peter G. Peterson. Volume II contains the background material which provided the basis for Mr. Peterson's briefings to the President and the Council on International Economic Policy during the year 1971. It includes 72 color chart protrayals of statistical data. Topics treated in this new, comprehensive study, looking ahead to the International Economy of the 1970's, include: Trade Trends; World Tariff Barriers; Balance of Payments; U.S. Foreign Direct Investment Abroad; Less Developed Countries; U.S. Use of Natural Resources; and OECD Countries Role in the World Economy. Reprinted

9.19 PLASTICS ON THE SARGASSO SEA SURFACE

Carpenter, Edward J., and K. L. Smith, Jr. (Woods Hole Oceanographic Institution, Woods Hole, MA 02543)
Science 175, No. 4027, 1240-1241 (Mar. 17, 1972)

In the course of studies involving sampling the pelagic Sargassum, the authors found plastic particles in their neuston (surface) nets. These plastic particles were found in amounts averaging 3,500 pieces (290 grams) per square kilometer in the western Sargasso Sea. They found that the pieces of plastic were brittle (probably due to the weathering of the plasticizers), and that many were in a pellet shape about 0.25 to 0.5 cm. in diameter. The pieces served as surfaces for the attachment of diatoms and hydroids. Because plastics contain considerable concentrations of polychlorinated biphenyls as plasticizers, the authors suggest that the plastics could be a source of some of the polychlorinated biphenyls recently found in oceanic organisms.
[1 figure, 1 table, 6 references] FTP

9.19 THE EFFECT OF WARM WATER DISCHARGED BY THE KONAKOVO POWER STATION ON THE DISTRIBUTION AND GROWTH OF YOUNG FISHES OF IVAN'KOVO RESERVOIR

Boytsov, M. P. (Upper Volga Department, State Research Institute for Lake and River Fishes, Konakovo, U.S.S.R.)
Journal of Ichthyology 11, No. 2, 257-262 (1971)

The young of 10 species of fish (roach, bream, perch, pike, white bream, rudd, bleak, ide, pope, "verkhovka") were found in the area affected by warm water from the power plant. The effect of the warm water was to increase the growing period of the fish and as a result the fish reached a considerably larger size and weight than they ordinarily would have.
[1 figure, 2 tables, 12 references] FTP

9.2 DEPARTMENT RELEASES 1972 EDITION OF "TREATIES IN FORCE"

Anonymous
Department of State Bulletin 66, No. 1704, 264 (Feb. 21, 1972)

The Department of State published on February 2 "Treaties in Force: A List of Treaties and Other International Agreements of the United States in Force on January 1, 1972."
This is a collection reflecting the bilateral relations of the United States with 156 countries or other political entities and the multilateral relations of the United States with other contracting parties to more than 370 treaties and agreements on 83 subjects. The 1972 edition lists some 200 new treaties and agreements.
The 1972 edition of "Treaties in Force" (404 pp., Department of State publication 8628) is for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, for $3.00. Reprinted in part

9.2 TECHNOLOGY AND THE ENVIRONMENT: AN ECONOMIC EXPLORATION

Rosenberg, Nathan (University of Wisconsin, Madison, WI 53706)
Technology and Culture XI, No. 4, 543-561 (Oct. 1971)

In this essay the author explores the nature of the technology-environment problem from an economic viewpoint and attempts to clarify some of the major issues and alternatives. He focuses on these problems as they confront members of an affluent society and then briefly turns to the special perspective of poor societies. [12 references] Ftd

9.19 CONTINUOUS SYSTEM MODELS OF OXYGEN DEPLETION IN A EUTROPHIC RESERVOIR

Varga, Louis P., and C. Paul Falls (Department of Chemistry, Oklahoma State University, Stillwater, OK 74074)
Environmental Science & Technology 6, No. 2, 135-142 (February 1972)

The assimilative capacity of a reservoir can be predicted by several mathematical simulation models that were developed for the Keystone Reservoir in north central Oklahoma.
[12 figures, 1 table, 35 references] FTP

9.16 POND CULTURE OF BAIT FISHES

Flickinger, Stephen A.
Cooperative Extension Service Bulletin 478A, 39 pp. (Apr. 1, 1971), Colorado State University, Colorado Cooperative Fishery Unit, Fort Collins, CO 80521. Available from the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22151. Order No. COM-72-10054,
NOAA Publications Announcement No. 72-5, Item 72-05-16-13, 7 (Feb. 1972)

Major considerations in the culture of the golden shiner and fathead minnow as bait fish are presented. Emphasis is upon economic considerations, pond construction, propagation techniques, feeding, and harvesting. (Author) Reprinted

9.19 REPORT OF THE ACMRR/SCOR/ACOMR/GESAMP JOINT WORKING PARTY ON GLOBAL INVESTIGATION OF POLLUTION IN THE MARINE ENVIRONMENT (GIPME)

Anonymous
FAO Fisheries Report No. 112, 21 pp. (1971) (Distribution restricted) Food and Agriculture Organization of the United Nations, Rome, Italy

This document contains the report of the ACMRR/SCOR/ACOMR/GESAMP Joint Working Party on Global Investigation of Pollution in the Marine Environment (GIPME). The Working Group, in view of the great variety of research efforts that will eventually be required to answer the questions relative to man's increasing pollution of the environment, identified some projects that should be initiated now. Thirteen recommendations were made. [The report was issued in English, French, Spanish, and Russian.] FTP

9.19 EFFECTS OF DETERGENTS ON WATER SUPPLIES

Harris, A. J., K. J. Roberts, and A. E. Christie (Ontario Water Resources Commission, Toronto, Ontario, Canada)
Journal of the American Water Works Association 63, No. 12, 795-799 (Dec. 1971)

The majority of the detergents have been phosphate-based. When they reach our waterways, they present problems not only of eutrophication but also of water-treatment. For example, because of the suspending and sequestering abilities of complex phosphates, they might interfere with coagulation and settling in a water-treatment plant. In this article, the authors discuss the nature of detergents and then they review the phosphate situation as it relates to potable water.
[1 table, 56 references] FTP

9.2 (2.1) TECHNOLOGICAL FORECAST OF MARINE TRANSPORTATION SYSTEMS 1970 TO 2000

Moore, Charles G. (School of Business and Economics, California State College, Los Angeles, Calif.), and Hugo P. Pomrehn (Bechtel Corp., Los Angeles, Calif.)
Technological Forecasting and Social Change 3, No. 1, 99-135 (1971)

This report is presented in four sections as follows: (1) United States Marine Transportation for the Period 1970 to 2000, (2) Forecast of United States Shipping Needs to the Year 2000, (3) Forecast of Marine Transport System Technical Capabilities to the Year 2000, and (4) Integration of Needs and Technical Capabilities Forecast.

The authors state that this paper demonstrates how several technological forecast tools can be applied to planning the future of U.S. marine transportation. In this forecast, they developed an assessment of the vessel design and performance factors, underway operation and navigation, vessel construction and shipyards, ports and terminals, and the sociopolitical factors required as a basis for such a plan. [33 figures, 4 tables, 37 references] FTP

9.3 LAW, FISH AND POLICY

Allen, Edward W.
International Lawyer 5, No. 4, 621-636 (Oct. 1971)

This article is a historical account of U.S. events concerned with the legal and policy aspects of the ocean fisheries. FTP

9.3 U.S. FOREIGN POLICY FOR THE 1970'S THE EMERGING STRUCTURE OF PEACE

Nixon, Richard (President of the United States of America)
Department of State Bulletin 66, No. 1707, 313-418 (Mar. 13, 1972)

This is the third report of this kind which the President has made to the United States Congress. The function of this report is to provide an understanding of the United States' policies and broad purposes in foreign affairs. On pages 409 to 411 the President discusses the Government's policy relative to the oceans. Several conclusions have emerged from the Administrations review of U.S. oceans policy as follows: (1) Multilateral agreement is essential, (2) Freedom of navigation and overflight must be protected, (3) An equitable system must be established for regulating the exploitation of the resources of the ocean and seabeds beyond national jurisdiction, and (4) It is not possible for any nation, acting unilaterally, to ensure adequate protection of the marine environment. The President summarized the oceans policy section by stating, "In summary, the U.S. is deeply engaged in an international effort to write a new law of the sea. We have put forth comprehensive proposals designed to harmonize the multiple uses of the oceans. There is no inherent incompatibility between proper utilization of ocean resources and traditional freedoms of the sea. But territorial concepts such as absolute sovereignty cannot be applied either to seabed resources beyond the limits of national jurisdiction or to international navigation rights. Modified maritime doctrines and rules are needed to accommodate the diverse interests involved. The time has arrived for monumental decisions on the law of the sea, and the U.S. has acted forthrightly to meet the challenge."

Extracted by FTP

9.3 NORTH SEA CONTINENTAL SHELF FEDERAL REPUBLIC OF GERMANY--DENMARK--THE NETHERLANDS

Anonymous
American Journal of International Law 65, No. 5, 901-914 (Oct. 1971)

The Federal Republic of Germany, Denmark, and The Netherlands signed treaties at Copenhagen on January 28, 1971 as follows: (1) the treaty between the Federal Republic of Germany and Denmark; treaty relating to the delimitation of the Continental Shelf under the North Sea and (2) the treaty between the Federal Republic of Germany and the Netherlands; treaty on the delimitation of the Continental Shelf under the North Sea. This article is an English translation of the treaties. FTP

9.3 OCEAN RESOURCES LAW

Authors and titles as listed below
Oregon Law Review 50, No. 3 (Part II), 373-618 (Spring 1971)

This is a special issue of the journal on Ocean Resources Law. It contains five articles and one comment as follows:
"Ocean Politics at the United Nations," by Hollis M. Dole and David P. Stang (U.S. Department of the Interior, Washington, D.C.), pp. 376-397.
This article discusses international political developments related to the world ocean and its underlying seabed. [19 footnotes]
"Organizing To Probe the Oceans: An Exercise in Political Science," by Thomas A. Clingan, Jr. (University of Miami, Coral Gables, Fla.), pp. 398-424.
It is suggested that the United States should take steps to consider the unification of its civil oceanic efforts into a single, effective organization having primary responsibility over the oceans. [78 footnotes]
"Regulation of Hard-Mineral Mining on the Continental Shelf," by Jon L. Jacobson and Thomas A. Hanlon (School of Law, University of Oregon, Eugene, Oreg.), pp. 425-461. [122 footnotes]
"International Law and Canada's Anti-Pollution Legislation," by L. C. Green (University of Alberta, Calgary, Alberta, Canada), pp. 462-490. [112 footnotes]
"International and National Approaches to Oil Pollution Responsibility: An Emerging Regime for a Global Problem," by Peter N. Swan (School of Law, University of Oregon, Eugene, Oreg.), pp. 506-586.
This article deals with the efforts to fix responsibility for the spillage or discharge of oil at sea or on navigable waters. [484 footnotes]

(over)

9.2 (9.16) THE LIVE BAIT INDUSTRY IN OHIO; ITS EXTENT, CONDITION AND PROBLEMS

Pierce, John M., and Marvin E. Wachtman
Completion Report, Project 4-64-D-1, 69 pp. (June 28, 1971), Ohio Department of Natural Resources, Division of Wildlife, Columbus, Ohio. Available from the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22151. Order No. COM-72-10057.
NOAA Publications Announcement No. 72-5, Item 72-05-16-16, 7 (Feb. 1972)

The industry consists of retail bait dealers, bait propagators, and wholesale bait dealers. The two baits most used in Ohio (crappie minnows and nightcrawlers) are the two baits in greatest shortage. The total quantity, number of dealers, prices and dollar volume in 1969 is presented for retail dealers, wholesale dealers, and bait propagators. (Author) Reprinted

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9.2 YEARBOOK OF FISHERY STATISTICS. CATCHES AND LANDINGS 1970

Anonymous
Food and Agriculture Organization of the United Nations, vol. 30, xxii + 476 pp. (1971). Price $9.00; £3.60; FF 45.00. (Via delle Terme di Caracalla, 00100 Rome, Italy) Available from sales agents and book sellers of FAO publications and from the Distribution and Sales Section, FAO, 00100 Rome, Italy. [In English, French, and Spanish]

This yearbook covers the catches or landings of all fish, crustaceans, molluscs, and other aquatic animals, residues, and plants, taken for all kinds of commercial, industrial, subsistence purposes by all types and classes of fishing units operating in fresh-water and marine areas. FTP

9.2 WORLD POPULATION GROWTH AND RELATED TECHNICAL PROBLEMS

Austin, Arthur L., and John W. Brewer (University of California, Davis, Calif.)
Technological Forecasting and Social Change 3, No. 1, 23-49 (1971)

This article gives data related to population growth, energy consumption, and life-support capabilities in a format designed specifically to satisfy the technologist. If our high rate of technical growth continues into the future, social systems will become more complex, with an increasing probability of malfunction unless closer attention is paid to the possible penalties associated with such advances. The authors indicate that the intent of this article is to emphasize the need for engineers and scientists to become aware of the importance of their work, and to stimulate thought regarding the relationship between technology and the ultimate quality of life.
[12 figures, 6 tables, 36 references] FTP

9.2 (9.3) THE UNITED NATIONS COMMITTEE ON NATURAL RESOURCES AND ITS CHALLENGE

De Seynes, Philippe (Under-Secretary General for Economic and Social Affairs of the United Nations)
Technological Forecasting and Social Change 3, No. 2, 155-158 (1972)

The United Nations should consider the problem of natural resources from the standpoint of the most far-reaching economic, social, and political cooperation possible and with a universal as possible an approach to the interests and objectives involved. The author indicates that the outlook for international cooperation in the field of natural resources is extremely satisfying and promising. FTP

9.3 THE STATES VERSUS INDIAN OFF-RESERVATION FISHING: A UNITED STATES SUPREME COURT ERROR

Johnson, Ralph W.
Washington Law Review 47, No. 2, 207-236 (1972)

As provided in the Constitution of the United States, treaties entered into by this Nation are the "Supreme Law of the land." That the agreements with the Indians--the author indicates--are treaties is too well supported by Supreme Court decisions to be questioned. Under the construction of the treaties with the Indians, the author states that a clear conflict exists between the states' regulatory schemes and the Indians' [fishing] treaty rights. Furthermore, he indicates that the Constitution of the United States requires the state regulations to yield. Two solutions to the Indian fishing rights problem are suggested. FTP
[119 footnotes]

9.3 "The Nixon Proposal for an International Seabed Authority," [comment], by John E. Frohnmayer (School of Law, University of Oregon), pp. 599-618. [96 footnotes] FTP

9.3 SELDEN REDIVIVUS -- TOWARDS A PARTITION OF THE SEAS

Friedmann, Wolfgang (Columbia University School of Law)
American Journal of International Law 65, No. 5, 757-770 (Oct. 1971)

The author concludes that the creation of an International Seabed Authority with jurisdiction extending much beyond the abyssal depths is unlikely in the foreseeable future. He believes that, in matters of conservation and pollution, there should be not only a widening of international agreements on standards, but the setting up, with the least possible delay, of an international conservation and pollution control authority. Although the direct powers of such an agency would be confined to the international seas beyond national jurisdiction, its standards could be extended to national jurisdictions by virtue of a series of agreements with the coastal states.

Furthermore, should extension of effective international conservation and pollution controls fail in the foreseeable future, the author believes further extension of national jurisdictional claims (that is, of national sovereignty) vertically extended from surface to subsoil appears inevitable. However, it may be possible to reach a compromise by which territorial waters are kept at the present generally accepted limit while the coastal states are given the power to extend pollution and conservation controls for a further 100-mile stretch (such as the recent Canadian pollution and conservation control legislation). The author indicates that perhaps the creation of such exclusive conservation and pollution control zones would give impetus to more energetic and effective international control measures and institutions.

Finally, he suggests that the exploitation of mineral resources and certain fisheries should, subject to agreed conservation and pollution standards, be carried out by bipartite or multipartite joint ventures.
[26 footnotes] FTP

9.3 (9.2) UNCOMMON CONTROVERSY: FISHING RIGHTS OF THE MUCKLESHOOT, PUYALLUP, AND NISQUALLY INDIANS

Edited by the American Friends Service Committee. Published by the University of Washington Press, Seattle, Wash. (1970), xxxi + 232 pp. Price $2.50
Lord, William B. (Department of Agricultural Economics, University of Wisconsin, Madison, WI 53706) (reviewer)
Transactions of the American Fisheries Society 101, No. 1, 136-137 (January 1972)

The introduction by Walter Taylor discusses the exploitative attitude towards nature (characteristic of Western culture) and the view of man living in harmony with nature (characteristic of American Indian culture). The first three chapters give a historical account of the relationship between Indian and non-Indian fishing rights from the earliest days of European exploration through the mid-nineteenth century treaty period to the present. A chapter on the law of Indian fishing rights was prepared by William Hanson. Two chapters contain information on the current status of the Indian fishing rights dispute and discuss the causes of depletion of the salmon runs. The final chapter discusses the value of diversity in natural ecosystems and in sociocultural systems. The authors suggest the establishment of a commission to allocate the salmon resource and to ensure against overfishing. FTP

9.6 (9.17) 1972 CONSERVATION DIRECTORY

Anonymous
Newsletter of the American Fisheries Society 16, No. 74, 6 (Jan.-Feb. 1972)

The 1972 issue of the Conservation Directory published by the National Wildlife Federation is now available. Copies may be obtained from the National Wildlife Federation, 1412 - 16th Street, N.W., Washington, DC 20036, for $2.00. The Directory contains a comprehensive listing of natural resource organizations, agencies, and officials in the conservation field. It has entries for more than 1,500 groups and 7,000 individuals. Other sections list congressional committees, federal and state agencies, and international, national, and interstate conservation organizations in the United States and Canada. Also, included are a guide to major colleges offering professional training for careers in conservation and an index to periodicals of interest. FTP

COMMERCIAL FISHERIES ABSTRACTS VOL. 25 NO. 6 PAGE 27

9.1 SYNOPSIS OF BIOLOGICAL DATA ON THE GREEN TURTLE CHELONIA MYDAS (LINNAEUS) 1758

Hirth, Harold F. (Department of Biology, University of Utah, Salt Lake City, UT 84112)
FAO Fisheries Synopsis No. 85, 79 pp. (Dec. 1971) Food and Agriculture Organization of the United Nations, Rome, Italy (Distribution restricted)

9.3 (9.17) CONVENTION DRAFTED FOR CONSERVATION OF ANTARCTIC SEALS

Anonymous
Department of State Bulletin 66, No. 1708, 456 (Mar. 20, 1972)

A delegation from the United States including representatives from private conservation organizations, together with the delegations from the 11 other signatories of the Antarctic Treaty of 1959 (Argentina, Australia, Belgium, Chile, French Republic, Japan, New Zealand, Norway, Republic of South Africa, U.S.S.R., United Kingdom), participated in a conference in London from February 3 to 11 which produced an agreed text of a Convention for the Conservation of Antarctic Seals.

This convention sets conservative total limits, based on seal population estimates of Antarctic scientists, for the taking of three species in any one year (crabeater, 175,000; leopard, 12,000; Weddell, 5,000) and forbids the killing or capturing of three other species (Ross, southern elephant, and fur seals of the genus arctocephalus). It also sets up reserve areas where sealing is prohibited and forbids the killing or capturing of seals in the water, except in limited quantities for scientific research.

The convention is to be open for signature from June 1 to December 31, 1972. Reprinted in part

COMMERCIAL FISHERIES ABSTRACTS VOL. 25 NO. 6 PAGE 27

9.6 (1.) THE LIVING RESOURCES OF THE WORLD OCEAN

Moiseev, P. A.
Izdatel'stvo "Pishchevaya Promyshlennost," Moskva, 1969. (In Russian)
Translated by N. Kaner and W. E. Ricker; edited by B. Golek, Israel Program for Scientific Translations, Jerusalem, Israel (1971), v + 334 pp. Available from the U.S. Department of Commerce, National Technical Information Service, Springfield, VA 22151.

The chapters include (1) Man's need for the biological resources of the ocean, (2) Certain properties of the oceans as producers of biological resources, (3) Production of biological resources, (4) Effectiveness of utilization of energy at different trophic levels, (5) Biological productivity of the ocean, (6) Utilization of biological resources of the ocean, (7) Marine and oceanic fisheries of the U.S.S.R., (8) Some aspects of international fishery problems, (9) Some ways to increase biological productivity of the ocean, and (10) Conclusion. [108 figures, 150 tables, 245 references to Russian publications, 152 references to publications in other languages, 4 appendices] FTP

COMMERCIAL FISHERIES ABSTRACTS VOL. 25 NO. 6 PAGE 27

9.3 LEGAL ASPECTS OF SEABED PETROLEUM AND MINERAL RESOURCE DEVELOPMENT--THE DRAFT UNITED NATIONS CONVENTION ON THE INTERNATIONAL SEABED AREA AND THE UNITED STATES WORKING PAPER SUBMITTED TO THE UNITED NATIONS SEABED COMMITTEE

Authors and titles as listed below
Natural Resources Lawyer 4, No. 4, 681-747 (Nov. 1971)

This issue contains some of the papers on the subject presented at the Offshore Technology Conference in Houston, Tex., on April 19-20, 1971. The papers consist of opening remarks by Hollis D. Hedberg and individual comments of John R. Stevenson, of David R. Stang, of Leigh Ratiner, of T. S. Ary, of Thomas A. Clingan, Jr., of Fernando Zeger, and of John R. Freeland, and the following articles: "The Outer Continental Shelf Lands Act--Its Adequacies and Limitations," by Raymond C. Coulter (Department of the Interior, Washington, D.C.), pp. 725-731. "Offshore Boundary and Title Issues," by Austin W. Lewis (Lisko and Lewis, New Orleans, La.), pp. 737-746. [31 footnotes] FTP

9.3 THE PREPARATION OF ARTICLE 1 OF THE CONVENTION ON THE CONTINENTAL SHELF

Oxman, Bernard H. (U.S. Department of State, Washington, DC 20520)
Journal of Maritime Law and Commerce 3, No. 2, 245-305 (Jan. 1972)

The purpose of this study was to examine the background of article 1 of the Convention of the Continental Shelf as revealed by the official records of the International Law Commission and the 1958 United Nations Conference on the Law of the Sea. Article 1 defines the term "continental shelf." Reports on the remainder of the author's study will appear in the April and July issues of this journal. [193 footnotes] FTP

9.7 USE OF COMPUTERS IN INFORMATION SYSTEMS

Lowry, W. Kenneth (Libraries and Information Systems, Bell Laboratories, Murray Hill, NJ 7974)
Science 175, No. 4024, 841-846 (Feb. 25, 1972)

The author describes seven computer systems for information handling taken from over 30 computer-aided technical information services and functions currently in operation. The information system developed at the author's company leans heavily on computers. A project of UNESCO and the International Council of Scientific Unions (ICSU) known as Unisist includes plans for a worldwide system of science information in which computer techniques are used. The author believes that the effectiveness of computers in information systems will become evident during the next 10 years. [1 figure, 14 references] FTP

9.6 LIST OF REFERENCES ON MILKFISH, CHANOS CHANOS (FORSKAL), IN TAIWAN (1952-1971)

Chen, Huei-Fin (Tungkang Marine Laboratory, Taiwan Fisheries Research Institute)
Aquiculture 1, No. 4, 23-28 (Dec. 1971)

This article lists 56 original research papers published during the period. The papers are classified into the following groups: fry, culture, feed and fertilization, benthic algae, pest and disease, ecology, and "others." The titles are in English and Chinese. The authors' names and references are in the original language of the journal or article. FTP

9.3 THE VOLUNTARY ABSTENTION PRINCIPLE AND JAPAN: SOME LEGAL AND POLITICAL IMPLICATIONS

Nishi, Toshio (University of Washington, Seattle, WA 98105)
Natural Resources Journal 11, No. 4, 657-673 (October 1971)

[23 footnotes]

9.3 INTERNATIONAL LAW OF THE SEA -- A REVIEW OF STATES' OFFSHORE CLAIMS AND COMPETENCES

Goldie, Louis F. E. (College of Law, Syracuse University, N.Y.)
Naval War College Review 24, No. 6, 43-66 (Feb. 1972)

In this article the author reviews many of the rules, legal and fictitious, and institutions that deal with the problem of states' offshore claims and competences, and he also examines some of the novel claims that states have made in their effort to exercise exclusive authority over offshore areas. FTP
[70 footnotes, appendix]

9.7 UNIVERSITY CURRICULA IN THE MARINE SCIENCES AND RELATED FIELDS, ACADEMIC YEARS 1971-1972 AND 1972-1973

Anonymous
Published by the Oceanographer of the Navy. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402 (1971), 214 pp., Order No. S/N 0842-0053. Price $1.75.
Selected U.S. Government Publications 1, No. 6, Item 53F (1972)

This report contains information on a wide diversity of curricula offered at 134 academic institutions throughout the country. It is published by the Oceanographer of the Navy in the hope that it will be of assistance to students in planning careers in the marine sciences. Reprinted

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9.6 OUR CHANGING FISHERIES

Shapiro, Sidney (editor)
Published by the National Marine Fisheries Service, NOAA, U.S. Department of Commerce (1972), 534 pp. Price $9.00.

In a news release dated March 15, 1972, the U.S. Department of Commerce announced publication of the book "Our Changing Fisheries." The book contains 30 chapters, prepared in popular style, on the commercial fisheries authored by the staff of the National Marine Fisheries Service. Some of the topics that are covered include fishery food science, exploratory fishing, gear research, economics of fisheries, and resource management. The book may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

0.6 FOOD-FLAVORING METHOD AND COMPOSITION USING 2-METHOXY-3-ISOBUTYLPYRAZINE

Buttery, Ron G. (Richmond, Calif.), Richard M. Seifert (El Cerrito, CA 94530), Robert E. Lundin (Berkeley, Calif.), and Dante G. Guadagni (Moraga, CA 94556); assignors to the United States of America as represented by the Secretary of Agriculture (pat.)
U.S. Patent 3,630,750
Official Gazette of the U.S. Patent Office 893, No. 4, 1436 (December 28, 1971)

2-Methoxy-3-isobutylpyrazine is produced by reacting leucine amide with glyoxal to produce the intermediate 2-hydroxy-3-isobutylpyrazine; then, the intermediate is methylated. The new compound gives off an intense aroma of freshly chopped green bell pepper and can be used for flavoring food products. FTP

2.1124 FISHING TRAP
(2.1474)

Stein, Julian (Franklin Square, NY 11010) (pat.)
U.S. Patent 3,638,346
Official Gazette of the U.S. Patent Office 895, No. 1, 35 (February 1, 1972)

This fishing trap enclosure has a trapping section and a storage section connected by a gate. Long-range directional sonic devices are appropriately spaced so as to concentrate the fish into the gathering area. Other directional sonic devices drive the fish into the trap. FTP

0.8 BIVALVIA DEPURATION SYSTEM
(9.19)

Woodridge, David D., Joseph Clyde Kitchel, and William R. Garrett (Brevard County, Fla.); assignors to National Shellfish Processors, Inc., Brevard County, Fla. (pat.)
U.S. Patent 3,641,982
Official Gazette of the U.S. Patent Office 895, No. 3, 883 (Feb. 15, 1972)

By means of this apparatus and system, oysters from contaminated waters can be cleansed and rendered marketable. FTP

2.3 CONTINUOUS FRYING DEVICE

Smith, Benjamin C., and Ernest R. Pridham (Lunenburg, Nova Scotia, Canada); assignors to National Sea Products Ltd., Halifax, Nova Scotia, Canada) (pat.)
U.S. Patent 3,635,149
Official Gazette of the U.S. Patent Office 894, No. 3, 931 (Jan. 18, 1972)

In this apparatus for deep fat frying of breaded foodstuffs, the foodstuff is supported in such a way for a period of time to allow the coating to become adequately cooked. Thus, the foodstuffs do not adhere to each other or to the cooking apparatus during the subsequent cooking stage. FTP

0.8 (2.3) PROCESS IN PLANT ODOR IMPROVEMENT

Nippon Synthetic Chemical Ind. Co. Ltd. (pat.)
Japanese Patent 30319/71
Food Technology 26, No. 1, 81 (January 1972)

Air from fish and meat processing plants is washed with an aqueous solution containing glyoxal. FTP

0.8 SCRUBBING METHOD AND APPARATUS

Mare, Ernest (Johannesburg, Transvaal, Republic of South Africa); assignor to J. Ronald Herschberger, Palo Alto, Calif. (pat.)
U.S. Patent 3,626,667
Official Gazette of the U.S. Patent Office 893, No. 2, 445 (December 14, 1971)

This gas scrubbing method and apparatus is designed to be used where it is necessary to obtain intermixing of liquid droplets and a gas. FTP

2.3 FISH PROCESSING

Maruyoshi Reizo KK (pat.)
Japanese Patent 29183/71
Food Technology 26, No. 1, 81 (January 1972)

Pieces of raw fish are coated with a mixture of sugar, salt, sodium glutamate, sodium succinate, an antioxidant, and potassium sorbate. The coated pieces are held for 10 to 16 hr. and then they are subjected to the action of brewers yeast. Finally, the coated pieces are dried, baked, and seasoned. FTP

2.3 OYSTER OPENING DEVICE

Reinke, Theodore S. (Cambridge, Md.) (pat.)
U.S. Patent 3,631,567
Official Gazette of the U.S. Patent Office 894, No. 1, 77 (Jan. 4, 1972)

This device is used to shuck oysters. FTP

3.33 ASEPTIC PACKAGING OF FOODS

Robinson, David V. (Laurel, MD 20810); assignor to Donald A. Rosini, Shamokin, PA 17110, a part interest (pat.)
U.S. Patent 3,643,586
Official Gazette of the U.S. Patent Office 895, No. 4, 1308 (Feb. 22, 1972)

The foods are sterilized, then they are packaged under aseptic conditions in presterilized containers. FTP

3.33 STERILIZATION

Unilever Ltd. (N.J.A. Van den Hemel) (pat.)
British Patent 1,247,860
BFMIRA Abstracts 24, No. 11, Abstract No. 3866, 788 (November 1971)

A method of sterilization of hermetically sealed containers which are not as robust as cans--e.g. aluminium foil containers which may be plastic coated. The containers are held in moulds and passed through a tube whilst in contact with each other. They are then heated in the tubes and the moulds help to compensate for the increased pressure in the containers produced during heating. Reprinted

6.54 PROTEIN FIBER PRODUCTION

Taiyo Fishery Co. Ltd. (pat.)
Japanese Patent 29776/71
Food Technology 26, No. 1, 86 (January 1972)

Edible protein fibers are prepared by drying raw collagen. The raw collagen is prepared by refining animal waste tissues (tendons, sinews, and skin). FTP

6.54 FOOD COMPOSITIONS CONTAINING MICROCRYSTALLINE COLLAGEN

Battista, Orlando A. (Yardley, PA 19067); assignor to FMC Corporation, New York, N.Y. (pat.)
U.S. Patent 3,632,350
Official Gazette of the U.S. Patent Office 894, No. 1, 275 (Jan. 4, 1972)

These food compositions contain a new physical form of collagen. The microcrystalline collagen is edible, is bland in taste, and is indistinguishable in the food compositions. FTP

6.54 METHOD OF PRODUCING PROTEINACEOUS FIBERS

Arima, Tetsuo (Ikeda, Osaka, Japan), and Yoichi Harada (Kawanishi, Hyogo, Japan); assignors to General Foods Corp., White Plains, N.Y. (pat.)
U.S. Patent 3,627,536
Official Gazette of the U.S. Patent Office 893, No. 2, 660 (Dec. 14, 1971)

These proteinaceous fibers can be used to prepare simulated meat products. FTP

0.8 RECOVERY OF PROTEINACEOUS MATERIAL FROM WASTE EFFLUENTS

Felicetta, Vincent F., and Robert O. Peacock (Georgia-Pacific Corp.)
U.S. Patent 3,622,510 (Nov. 23, 1971)
Chemical Abstracts 76, No. 6, 27817c (Feb. 7, 1972)

2.3 SHRIMP-PEELING MACHINE

Mathiesen, Erik Hedeager (Langemosenej 26, 2880 Bagsvaerd, Denmark) (pat.)
U.S. Patent 3,634,909
Official Gazette of the U.S. Patent Office 894, No. 3, 870 (Jan. 18, 1972)

In this machine for peeling shrimp, the shrimp advance in a channel formed by two counterrotating rollers. FTP

2.1125 ADJUSTABLE PURSE RING STRIPPER
(2.1475)

Whaley, Morris L. (Bonita, CA 92002) (pat.)
U.S. Patent 3,638,345
Official Gazette of the U.S. Patent Office 895, No. 1, 34 (February 1, 1972)

In the process of recovering a purse seine containing fish, a pickup line is passed through the gathered purse rings and is attached at one end to a prong mounted on the side of the boat. The rings are made to slide on the prong by hoisting the other end of the pickup line, thus they are retained in order without the need for manual handling. Furthermore, when the empty net is stowed, the rings strip off the prong in proper order. FTP

3.61 FREEZE-DRYING APPARATUS

Oetjen, G. W., F. J. Schmitz, H. Eilenberg; Leybold-Heraeus-Verwaltung G.m.b.H. (pat.)
U.S. Patent 3,612,411
Food Technology 26, No. 1, 86 (January 1972)

This is a continuous freeze-drying apparatus. FTP

3.61 FREEZING PROCESS

Certified Mfg. Co. (pat.)
British Patent 1,244,580
Food Technology 26, No. 1, 86 (January 1972)

The food is frozen by passing it through a tunnel into which liquid carbon dioxide is sprayed. FTP

2.3 APPARATUS FOR THE STERILIZATION OF FOOD PRODUCTS

Vallee, Felix Alexandre Jules (7 rue Marcel Renault, Paris, 17eme, France) (pat.)
U.S. Patent 3,641,917
Official Gazette of the U.S. Patent Office 895, No. 3, 867 (Feb. 15, 1972)

With this apparatus, food products contained in loosely sealed receptacles are sterilized. The receptacles containing the food are placed in an autoclave, then a vacuum is drawn and steam is introduced to effect sterilization of the food. After the product is sterilized, the pressure in the autoclave is reduced by drawing off or condensing the steam, during which time the food product is cooled. Finally, a sterile inert gas is introduced into the autoclave to balance out the pressure and the receptacles are sealed before they are brought into contact with outside air. FTP

9.16 METHOD OF GROWING OYSTERS
(1.81)

Budge, William W. (Hillsborough, CA 94010), and Malcolm Donald (Woodside, CA 94062); assignors to Pacific Mariculture, Inc., Pescadero, CA 94060 (pat.)
U.S. Patent 3,638,615
Official Gazette of the U.S. Patent Office 895, No. 1, 105 (Feb. 1, 1972)

In this method for growing oysters in sea water, the seed oysters are secured to a member of the apparatus using an adhesive. Also, the oysters are arranged in a predetermined pattern and are so spaced that they can grow to a substantially large size without deforming each other. FTP

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